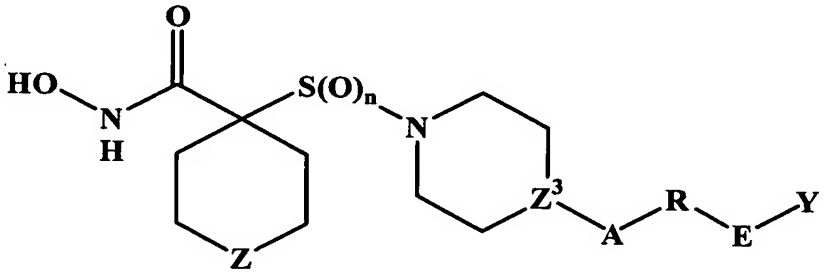
WE CLAIM:

1. A process for making a hydroxamic acid compound or a salt thereof, wherein:

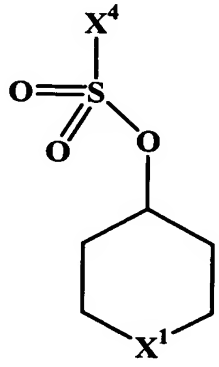
the process comprises reacting a 4-sulfonyloxy-heterocyclyl compound or a 4-halo-heterocyclyl compound with a metal thioester; and

the hydroxamic acid compound corresponds in structure to Formula (1-1):



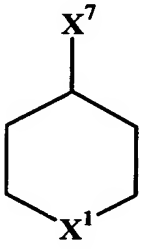
(1-1); and

the 4-sulfonyloxy-heterocyclyl compound corresponds in structure to Formula (1-2):



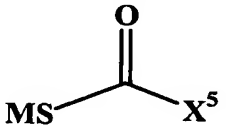
(1-2); and

the 4-halo-heterocyclyl compound corresponds in structure to Formula (1-3):



(1-3); and

the metal thioester corresponds in structure to Formula (1-4):



(1-4); and

n is selected from the group consisting of zero, 1, and 2; and

X^1 is selected from the group consisting of -O-, -S-, -S(O)-, -$S(O)_2$-, and -$N(R^{x1})$-; and

X^4 is selected from the group consisting of alkyl, haloalkyl, aryl, and haloaryl; and

X^5 is selected from the group consisting of alkyl, aryl, and arylalkyl, wherein:

the alkyl, aryl, and arylalkyl are optionally substituted with one or more independently selected halogen; and

X^7 is halogen; and

M is a metal cation; and

Z is selected from the group consisting of -O-, -S-, -S(O)-, -$S(O)_2$-, and -$N(R^x)$-; and

Z^3 is selected from the group consisting of nitrogen and carbon bonded to hydrogen; and

R^x is selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, R^a-oxyalkyl, aminosulfonyl, alkylsulfonyl, R^aR^a-aminoalkyl, carbocyclyl, carbocyclylalkyl, carbocyclylsulfonyl, heterocyclyl, heterocyclylalkyl, and heterocyclylsulfonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, amino, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkylthio, alkoxyalkyl, and alkoxyalkoxy, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, and alkyl; and

R^{x1} is a nitrogen-protecting group; and

A is selected from the group consisting of -O-, -S-, -S(O)-, -$S(O)_2$-, -C(O)-, -NR^b-, -CO-$N(R^b)$, -$N(R^b)$-C(O)-, -C(O)-O-, -O-C(O)-, -O-C(O)-O-, -HC=CH-, -C≡C-, -N=N-, -C(S)-$N(R^b)$-, -$N(R^b)$-C(S)-, alkyl, alkoxy, oxyalkyl, alkylthio, thioalkyl, and a bond; and

R is selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxyalkyl, carbocyclyl, heterocyclyl, carbocyclylalkyl, heterocyclylalkyl, carbocyclyloxyalkyl, heterocyclyloxyalkyl, carbocyclylthioalkyl, and heterocyclylthioalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, nitro,

nitroso, hydroxy, oxo, alkyl, alkoxy, alkylthio, alkoxyalkyl, alkoxycarbonylalkyl, C_1-C_2-alkylenedioxy, and alkoxycarbonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

E is selected from the group consisting of -O-, -C(O)-, -C(O)-O-, -O-C(O)-, -N(R^b)-, -C(O)-N(R^b)-, -N(R^b)-C(O)-, -C(O)-N(R^b)-N(R^b)-C(O)-, -N(R^b)-C(O)-N(R^b)-, -S-, -S(O)-, -S$(O)_2$-, -N(R^b)-S$(O)_2$-, -S$(O)_2$-N(R^b)-, -O-S$(O)_2$-, -S$(O)_2$-O-, -C(NH)-, -C(NOH)-, -N(R^b)-C(NH)-, -N(R^b)-C(NOH)-, -C(NH)-N(R^b)-, -C(NOH)-N(R^b)-, alkyl, alkenyl, carbonylalkyl, alkylcarbonyl, and a bond, wherein:

any alkyl or alkenyl portion of a substituent in such group optionally is substituted with one or more independently selected R^c substituents; and

Y is selected from the group consisting of hydrogen, halogen, cyano, alkyl, alkenyl, alkynyl, alkoxyalkyl, alkoxyalkoxyalkyl, alkylthioalkyl, alkylthioalkylthioalkyl, alkylthioalkoxyalkyl, alkoxyalkylthioalkyl, carbocyclyl, carbocyclylalkyl, carbocyclylalkoxyalkyl, heterocyclyl, heterocyclylalkyl, and heterocyclylalkoxyalkyl, wherein:

any member of such group optionally is substituted with one or more independently selected R^d substituents; and

each R^a is independently selected from the group consisting of hydrogen, hydroxy, alkyl, alkenyl, alkynyl, alkoxy, alkoxyalkyl, bisalkoxyalkyl, alkylthioalkyl, alkylthioalkenyl, alkylsulfoxidoalkyl, alkylsulfonyl, alkylsulfonylalkyl, carbocyclyl, carbocyclylalkyl, carbocyclyloxyalkyl, carbocyclylalkoxyalkyl, carbocyclylthioalkyl, carbocyclylthioalkenyl, carbocyclylsulfoxidoalkyl, carbocyclylsulfonyl, carbocyclylsulfonylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclyloxyalkyl, heterocyclylalkoxyalkyl, heterocyclylthioalkyl, heterocyclylsulfoxidoalkyl, heterocyclylsulfonyl, heterocyclylsulfonylalkyl, aminoalkyl, aminosulfonyl, aminoalkylsulfonyl, and alkoxyalkylaminoalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkylcarbonyl, carbocyclyl, and carbocyclylalkyl; and

each R^b is independently selected aryl; and

each R^c is independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, -C(H)(NH), -C(H)(NOH), thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkenyl, alkynyl, alkoxyalkyl, alkylthio, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, and carbocyclylalkyl; and

each R^d is independently selected from the group consisting of halogen, hydroxy, cyano, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkoxyalkyl, -C(O)(R^g), -S-R^e, -S(O)$_2$-R^e, carbocyclyl, alkylcarbocyclyl, carbocyclylalkyl, heterocyclyl, alkylheterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^e is independently selected from the group consisting of hydrogen alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^g is independently selected from the group consisting of hydrogen, alkyl, -O-R^h, carbocyclylalkyl, and heterocyclylalkyl; and

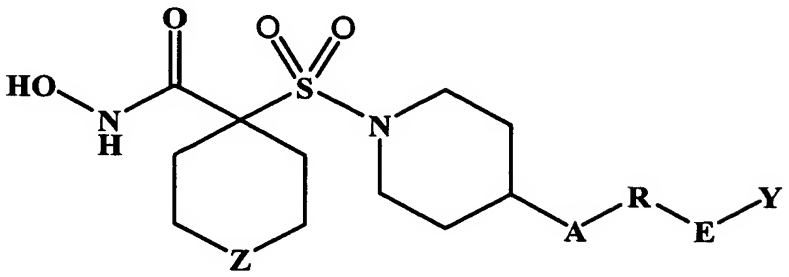
any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^h is independently selected from the group consisting of hydrogen, alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

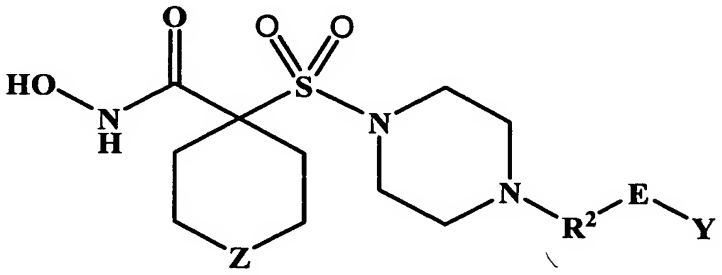
any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino.

2. A process according to claim 1, wherein:

the hydroxamic acid compound corresponds in structure to a formula selected from the group consisting of:



(2-1), and



(2-2); and

R^2 is selected from the group consisting of aryl and heteroaryl, wherein:

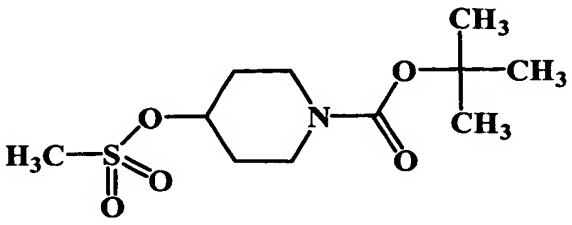
the aryl or heteroaryl optionally is substituted with one or more substituents independently selected from the group consisting of halogen, nitro, nitroso, hydroxy, alkyl, alkoxy, alkylthio, alkoxyalkyl, alkoxycarbonylalkyl, C_1-C_2-alkylenedioxy, and alkoxycarbonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino.

3. A process according to claim 2, wherein Z is -N(R^x)-:

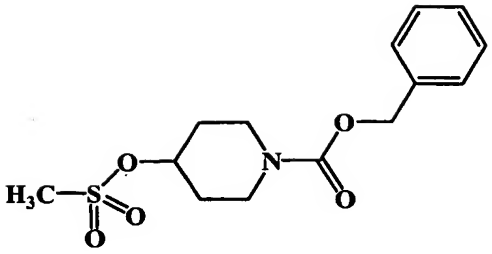
4. A process according to claim 2, wherein the metal thioester comprises potassium thioacetate.

5. A process according to claim 2, wherein the 4-sulfonyloxy-heterocyclyl compound corresponds in structure to Formula (5-1):



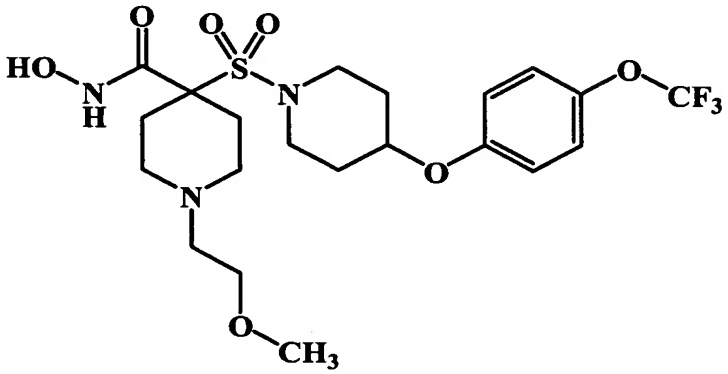
(5-1)

and



(5-2).

6. A process according to claim 2, wherein the hydroxamic acid compound corresponds in structure to Formula (6-1):



(6-1).

7. A process according to claim 2, wherein the process comprises reacting the 4-halo-heterocyclyl compound with the metal thioester.

8. A process according to claim 2, wherein the process comprises reacting the 4-sulfonyloxy-heterocyclyl compound with the metal thioester.

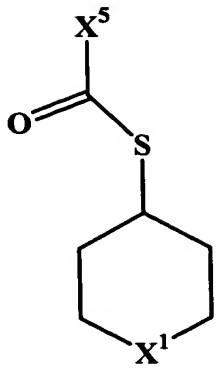
9. A process according to claim 8, wherein:

the process comprises:

reacting the 4-sulfonyloxy-heterocyclyl compound with the metal thioester to form a 4-thioester-heterocyclyl compound, and

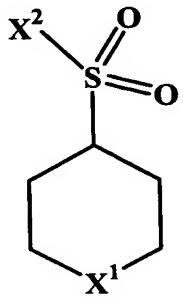
oxidatively halogenating the 4-thioester-heterocyclyl compound to form a 4-halosulfonyl-heterocyclyl compound; and

the 4-thioester-heterocyclyl compound corresponds in structure to Formula (9-1):



(9-1); and

the 4-halosulfonyl-heterocyclyl compound corresponds in structure to Formula (9-2):



(9-2); and

X^2 is halogen.

10. A process according to claim 9, wherein:

X^2 is chloro; and

the oxidative halogenation comprises combining the 4-thioester-heterocyclyl compound with a source of Cl_2, N-chlorosuccinimide, or 1,3-dichloro-5,5-dimethylhydantoin.

11. A process according to claim 9, wherein X^1 is -N(R^{x1})-.

12. A process according to claim 11, wherein:

the process further comprises:

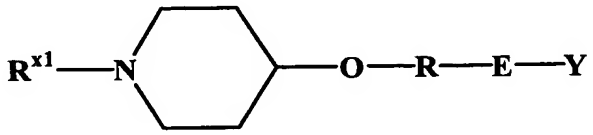
reacting a second amount of the 4-sulfonyloxy-heterocyclyl compound with an alcohol to form a protected cyclic amino compound having a nitrogen protecting group (R^{x1}), and

removing the nitrogen protecting group from the cyclic amino compound to form an unprotected cyclic amino compound, and

reacting the 4-halosulfonyl-heterocyclcyl compound with the unprotected cyclic amino compound; and

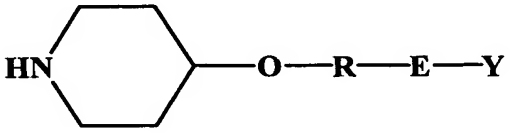
the alcohol is HO-R-E-Y; and

the protected cyclic amino compound corresponds in structure to Formula (12-1):



(12-1); and

the unprotected cyclic amino compound corresponds in structure to Formula (12-2):



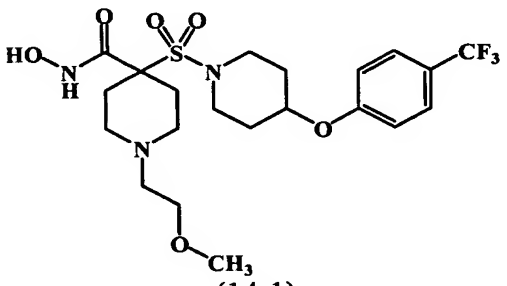
(12-2).

13. A process according to claim 12, wherein:

R is phenyl, and

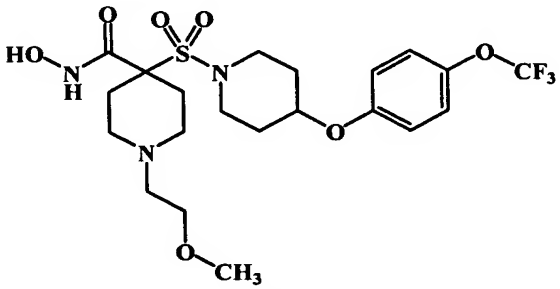
E-Y is selected from the group consisting of fluoroalkyl and fluoroalkoxy.

14. A process according to claim 13, wherein the hydroxamic acid compound corresponds in structure to Formula (14-1):



(14-1)

and

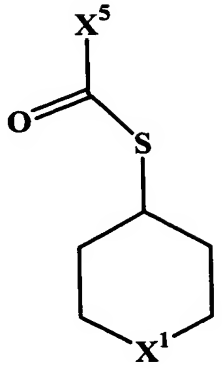


(14-2).

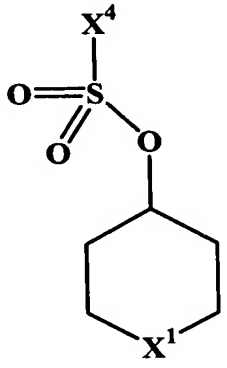
15. A process for making a 4-thioester-heterocyclyl compound, wherein:

the process comprises reacting a 4-sulfonyloxy-heterocyclyl compound or a 4-halo-heterocyclyl compound with a metal thioester; and

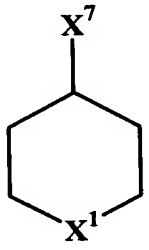
the 4-thioester-heterocyclyl compound corresponds in structure to Formula (15-1):


(15-1); and

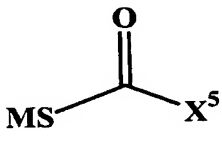
the 4-sulfonyloxy-heterocyclyl compound corresponds in structure to Formula (15-2):


(15-2); and

the 4-halo-heterocyclyl compound corresponds in structure to Formula (15-3):


(15-3); and

the metal thioester corresponds in structure to Formula (15-4):


(15-4); and

X^1 is selected from the group consisting of -O-, -S-, -S(O)-, $-S(O)_2-$, and $-N(R^{x1})-$; and

X^4 is selected from the group consisting of alkyl, haloalkyl, aryl, and haloaryl; and

X^5 is selected from the group consisting of alkyl, aryl, and arylalkyl, wherein:

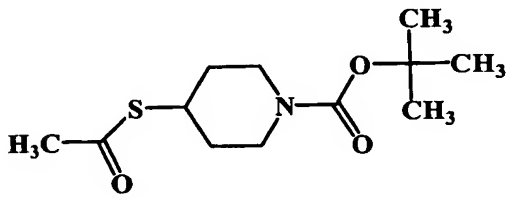
the alkyl, aryl, and arylalkyl are optionally substituted with one or more independently selected halogen; and

X^7 is halogen; and

M is a metal cation; and

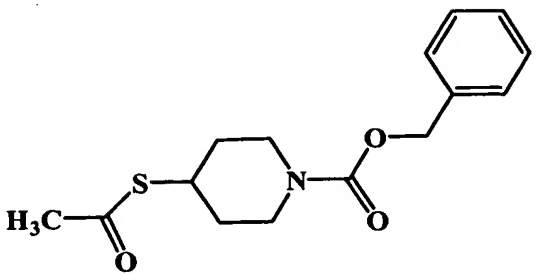
R^{x1} is a nitrogen-protecting group.

16. A process according to claim 15, wherein the 4-thioester-heterocyclyl compound corresponds in structure to Formula (16-1):



(16-1)

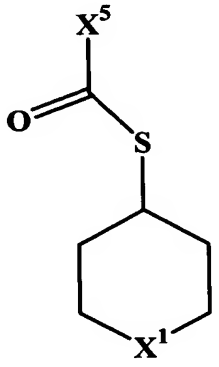
and



(16-2).

17. A compound or a salt thereof, wherein:

the compound corresponds in structure to Formula (17-1):



(17-1); and

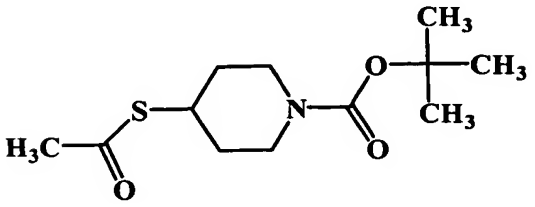
X^1 is selected from the group consisting of -O-, -S-, -S(O)-, $-S(O)_2-$, and $-N(R^{x1})-$; and

X^5 is selected from the group consisting of alkyl, aryl, and arylalkyl, wherein:

the alkyl, aryl, and arylalkyl are optionally substituted with one or more independently selected halogen; and

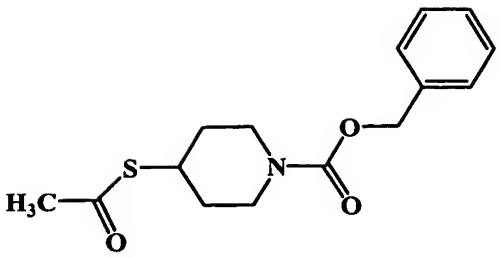
R^{x1} is a nitrogen-protecting group.

18. A compound or salt thereof according to claim 17, wherein the compound corresponds in structure to Formula (18-1):



(18-1)

and

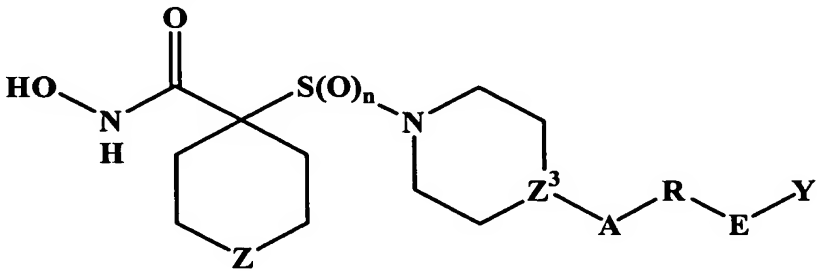


(18-2).

19. A process for making a hydroxamic acid compound or a salt thereof, wherein:

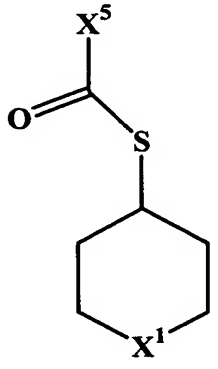
the process comprises oxidatively halogenating a 4-thioester-heterocyclyl compound; and

the hydroxamic acid compound corresponds in structure to Formula (19-1):



(19-1); and

the 4-thioester-heterocyclyl compound corresponds in structure to Formula (19-2):



(19-2); and

n is selected from the group consisting of zero, 1, and 2; and

X^1 is selected from the group consisting of -O-, -S-, -S(O)-, $-S(O)_2-$, and $-N(R^{x1})-$; and

X^5 is selected from the group consisting of alkyl, aryl, and arylalkyl, wherein:

the alkyl, aryl, and arylalkyl are optionally substituted with one or more independently selected halogen; and

Z is selected from the group consisting of -O-, -S-, -S(O)-, $-S(O)_2-$, and $-N(R^x)-$; and

Z^3 is selected from the group consisting of nitrogen and carbon bonded to hydrogen; and

R^x is selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, R^a-oxyalkyl, aminosulfonyl, alkylsulfonyl, R^aR^a-aminoalkyl, carbocyclyl, carbocyclylalkyl, carbocyclylsulfonyl, heterocyclyl, heterocyclylalkyl, and heterocyclylsulfonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, amino, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkylthio, alkoxyalkyl, and alkoxyalkoxy, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, and alkyl; and

R^{x1} is a nitrogen-protecting group; and

A is selected from the group consisting of -O-, -S-, -S(O)-, -$S(O)_2$-, -C(O)-, -NR^b-, -CO-N(R^b), -N(R^b)-C(O)-, -C(O)-O-, -O-C(O)-, -O-C(O)-O-, -HC=CH-, -C≡C-, -N=N-, -C(S)-N(R^b)-, -N(R^b)-C(S)-, alkyl, alkoxy, oxyalkyl, alkylthio, thioalkyl, and a bond; and

R is selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxyalkyl, carbocyclyl, heterocyclyl, carbocyclylalkyl, heterocyclylalkyl, carbocyclyloxyalkyl, heterocyclyloxyalkyl, carbocyclylthioalkyl, and heterocyclylthioalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, nitro, nitroso, hydroxy, oxo, alkyl, alkoxy, alkylthio, alkoxyalkyl, alkoxycarbonylalkyl, C_1-C_2-alkylenedioxy, and alkoxycarbonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

E is selected from the group consisting of -O-, -C(O)-, -C(O)-O-, -O-C(O)-, -N(R^b)-, -C(O)-N(R^b)-, -N(R^b)-C(O)-, -C(O)-N(R^b)-N(R^b)-C(O)-, -N(R^b)-C(O)-N(R^b)-, -S-, -S(O)-, -$S(O)_2$-, -N(R^b)-$S(O)_2$-, -$S(O)_2$-N(R^b)-, -O-$S(O)_2$-, -$S(O)_2$-O-, -C(NH)-, -C(NOH)-, -N(R^b)-C(NH)-, -N(R^b)-C(NOH)-, -C(NH)-N(R^b)-, -C(NOH)-N(R^b)-, alkyl, alkenyl, carbonylalkyl, alkylcarbonyl, and a bond, wherein:

any alkyl or alkenyl portion of a substituent in such group optionally is substituted with one or more independently selected R^c substituents; and

Y is selected from the group consisting of hydrogen, halogen, cyano, alkyl, alkenyl, alkynyl, alkoxyalkyl, alkoxyalkoxyalkyl, alkylthioalkyl, alkylthioalkylthioalkyl, alkylthioalkoxyalkyl, alkoxyalkylthioalkyl, carbocyclyl, carbocyclylalkyl, carbocyclylalkoxyalkyl, heterocyclyl, heterocyclylalkyl, and heterocyclylalkoxyalkyl, wherein:

any member of such group optionally is substituted with one or more independently selected R^d substituents; and

each R^a is independently selected from the group consisting of hydrogen, hydroxy, alkyl, alkenyl, alkynyl, alkoxy, alkoxyalkyl, bisalkoxyalkyl, alkylthioalkyl, alkylthioalkenyl, alkylsulfoxidoalkyl, alkylsulfonyl, alkylsulfonylalkyl, carbocyclyl, carbocyclylalkyl, carbocyclyloxyalkyl, carbocyclylalkoxyalkyl, carbocyclylthioalkyl, carbocyclylthioalkenyl, carbocyclylsulfoxidoalkyl, carbocyclylsulfonyl, carbocyclylsulfonylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclyloxyalkyl, heterocyclylalkoxyalkyl, heterocyclylthioalkyl, heterocyclylsulfoxidoalkyl, heterocyclylsulfonyl, heterocyclylsulfonylalkyl, aminoalkyl, aminosulfonyl, aminoalkylsulfonyl, and alkoxyalkylaminoalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkylcarbonyl, carbocyclyl, and carbocyclylalkyl; and

each R^b is independently selected aryl; and

each R^c is independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, -C(H)(NH), -C(H)(NOH), thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkenyl, alkynyl, alkoxyalkyl, alkylthio, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, and carbocyclylalkyl; and

each R^d is independently selected from the group consisting of halogen, hydroxy, cyano, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkoxyalkyl, -C(O)(R^g), -S-

R^e, $-S(O)_2-R^e$, carbocyclyl, alkylcarbocyclyl, carbocyclylalkyl, heterocyclyl, alkylheterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^e is independently selected from the group consisting of hydrogen alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^g is independently selected from the group consisting of hydrogen, alkyl, $-O-R^h$, carbocyclylalkyl, and heterocyclylalkyl; and

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

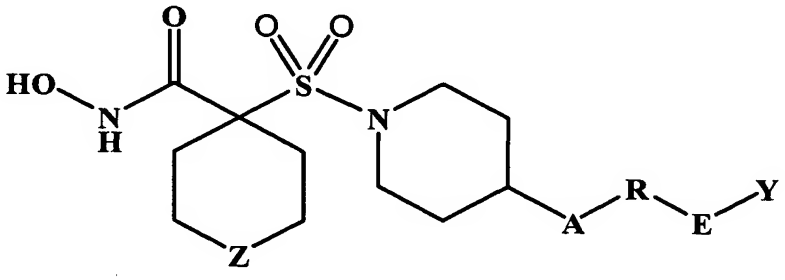
each R^h is independently selected from the group consisting of hydrogen, alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino.

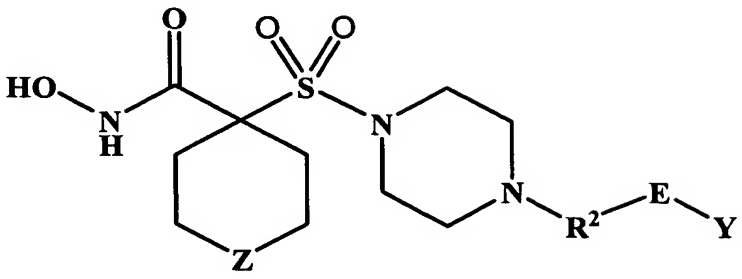
20. A process according to claim 19, wherein R^{x1} is selected from the group consisting of alkoxyalkyl, alkoxycarbonyl, and arylalkoxycarbonyl.

21. A process according to claim 19, wherein:

the hydroxamic acid compound corresponds in structure to a formula selected from the group consisting of:



(21-1), and



(21-2); and

R^2 is selected from the group consisting of aryl and heteroaryl, wherein:

the aryl or heteroaryl optionally is substituted with one or more substituents independently selected from the group consisting of halogen, nitro, nitroso, hydroxy, alkyl, alkoxy, alkylthio, alkoxyalkyl, alkoxycarbonylalkyl, C_1-C_2-alkylenedioxy, and alkoxycarbonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino.

22. A process according to claim 21, wherein Z is -N(R^x)-.

23. A process according to claim 21, wherein the oxidative halogenation comprises combining the 4-thioester-heterocyclyl compound with a source of Cl_2, N-chlorosuccinimide, or 1,3-dichloro-5,5-dimethylhydantoin.

24. A process according to claim 23, wherein the combination of the 4-thioester-heterocyclyl compound with the source of Cl_2, N-chlorosuccinimide, or 1,3-dichloro-5,5-dimethylhydantoin occurs in the presence of an alcohol, acetic acid, or a chloroalkyl solvent.

25. A process according to claim 24, wherein the 4-thioester-heterocyclyl compound is combined with a source of Cl_2.

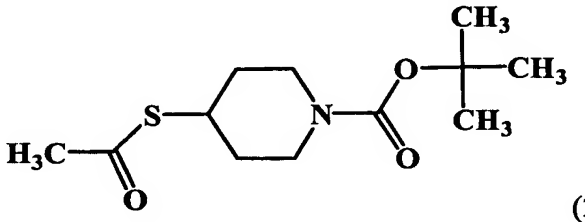
26. A process according to claim 25, wherein the combination of the 4-thioester-heterocyclyl compound with the source of Cl_2 occurs in the presence of ethanol.

27. A process according to claim 25, wherein the combination of the 4-thioester-heterocyclyl compound with the source of Cl_2 occurs in the presence of glacial acetic acid.

28. A process according to claim 25, wherein the combination of the 4-thioester-heterocyclyl compound with the source of Cl_2 occurs in the presence of a chloroalkyl solvent selected from the group consisting of CCl_4, $CHCl_3$, and CCl_2.

29. A process according to claim 24, wherein:

the 4-thioester-heterocyclyl compound corresponds in structure to Formula (29-1):

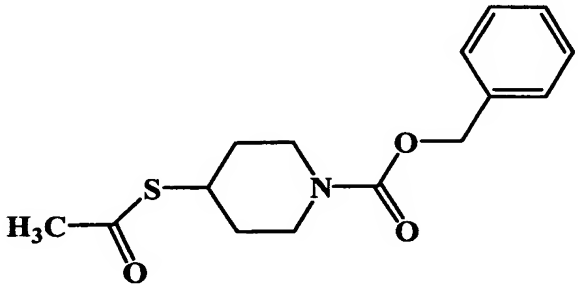


(29-1), and

the 4-thioester-heterocyclyl compound is combined with a source of Cl_2 in the presence of ethanol.

30. A process according to claim 24, wherein:

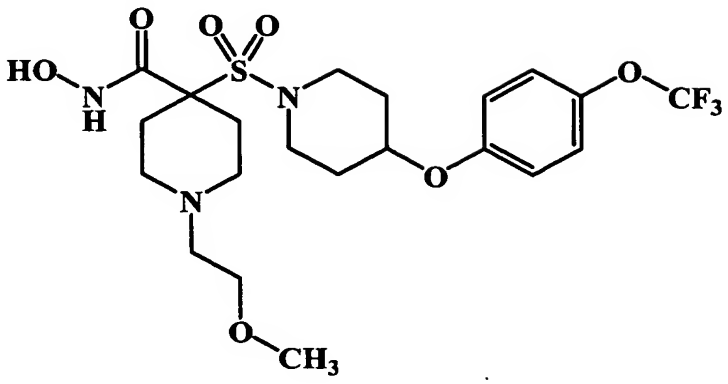
the 4-thioester-heterocyclyl compound corresponds in structure to Formula (30-1):



(30-1), and

the 4-thioester-heterocyclyl compound is combined with a source of Cl_2 in the presence of glacial acetic acid.

31. A process according to claim 24, wherein the hydroxamic acid compound corresponds in structure to Formula (31-1):

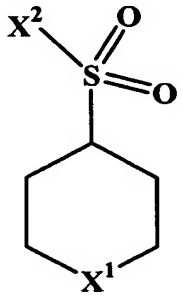


(31-1).

32. A process for making a 4-halosulfonyl-heterocyclyl compound, wherein:

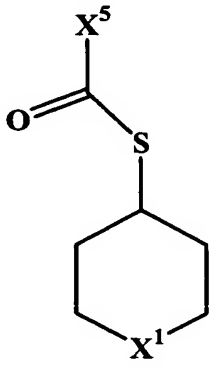
the process comprises oxidatively halogenating a 4-thioester-heterocyclyl compound; and

the 4-halosulfonyl-heterocyclyl compound corresponds in structure to Formula (32-1):



(32-1); and

the 4-thioester-heterocyclyl compound corresponds in structure to Formula (32-2):



(32-2); and

X^1 is selected from the group consisting of -O-, -S-, -S(O)-, $-S(O)_2-$, and $-N(R^{x1})-$; and

X^2 is halogen; and

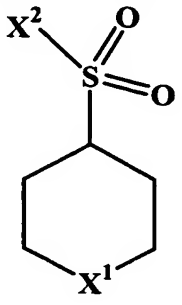
X^5 is selected from the group consisting of alkyl, aryl, and arylalkyl, wherein:

the alkyl, aryl, and arylalkyl are optionally substituted with one or more independently selected halogen; and

R^{x1} is a nitrogen-protecting group.

33. A compound or a salt thereof, wherein:

the compound corresponds in structure to Formula (33-1):



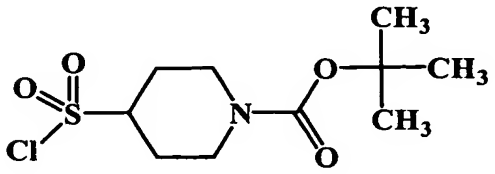
(33-1); and

X^1 is selected from the group consisting of -O-, -S-, -S(O)-, -$S(O)_2$-, and -$N(R^{x1})$-; and

X^2 is halogen; and

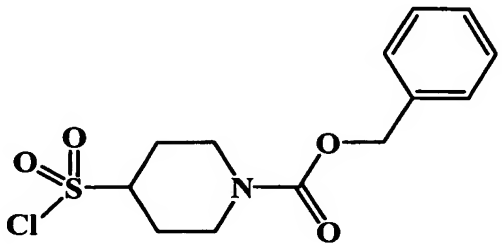
R^{x1} is a nitrogen-protecting group.

34. A compound or salt thereof according to claim 33, wherein the compound corresponds in structure to Formula (34-1):



(34-1)

and

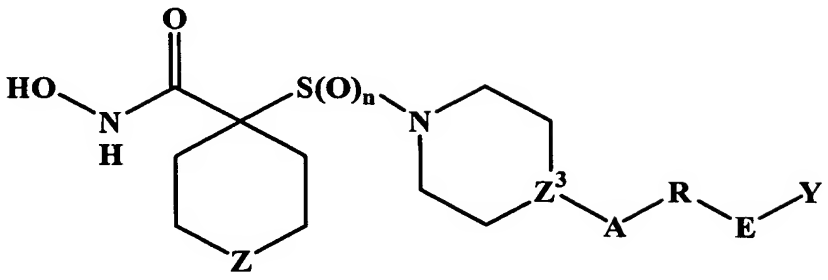


(34-2).

35. A process for making a hydroxamic acid compound or a salt thereof, wherein:

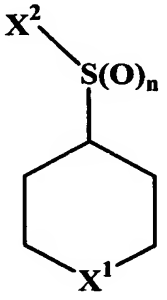
the process comprises reacting a 4-halosulfur-heterocyclyl compound with a cyclic amino compound; and

the hydroxamic acid compound corresponds in structure to Formula (35-1):



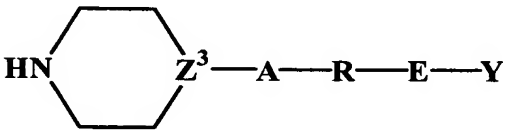
(35-1); and

the 4-halosulfur-heterocyclyl compound corresponds in structure to Formula (35-2):



(35-2); and

the cyclic amino compound corresponds in structure to Formula (35-3):



(35-3); and

each n is independently selected from the group consisting of zero, 1, and 2; and

X^1 is selected from the group consisting of -O-, -S-, -S(O)-, $-S(O)_2-$, and $-N(R^{x1})-$; and

X^2 is halogen; and

Z is selected from the group consisting of -O-, -S-, -S(O)-, $-S(O)_2-$, and $-N(R^x)-$; and

Z^3 is selected from the group consisting of nitrogen and carbon bonded to hydrogen; and

R^x is selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, R^a-oxyalkyl, aminosulfonyl, alkylsulfonyl, R^aR^a-aminoalkyl, carbocyclyl, carbocyclylalkyl, carbocyclylsulfonyl, heterocyclyl, heterocyclylalkyl, and heterocyclylsulfonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, amino, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkylthio, alkoxyalkyl, and alkoxyalkoxy, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, and alkyl; and

R^{xl} is a nitrogen-protecting group; and

A is selected from the group consisting of -O-, -S-, -S(O)-, -$S(O)_2$-, -C(O)-, -NR^b-, -CO-$N(R^b)$, -$N(R^b)$-C(O)-, -C(O)-O-, -O-C(O)-, -O-C(O)-O-, -HC=CH-, -C≡C-, -N=N-, -C(S)-$N(R^b)$-, -$N(R^b)$-C(S)-, alkyl, alkoxy, oxyalkyl, alkylthio, thioalkyl, and a bond; and

R is selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxyalkyl, carbocyclyl, heterocyclyl, carbocyclylalkyl, heterocyclylalkyl, carbocyclyloxyalkyl, heterocyclyloxyalkyl, carbocyclylthioalkyl, and heterocyclylthioalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, nitro, nitroso, hydroxy, oxo, alkyl, alkoxy, alkylthio, alkoxyalkyl, alkoxycarbonylalkyl, C_1-C_2-alkylenedioxy, and alkoxycarbonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

E is selected from the group consisting of -O-, -C(O)-, -C(O)-O-, -O-C(O)-, -$N(R^b)$-, -C(O)-$N(R^b)$-, -$N(R^b)$-C(O)-, -C(O)-$N(R^b)$-$N(R^b)$-C(O)-, -$N(R^b)$-C(O)-$N(R^b)$-, -S-, -S(O)-, -$S(O)_2$-, -$N(R^b)$-$S(O)_2$-, -$S(O)_2$-$N(R^b)$-, -O-$S(O)_2$-, -$S(O)_2$-O-, -C(NH)-, -C(NOH)-, -$N(R^b)$-C(NH)-, -$N(R^b)$-C(NOH)-, -C(NH)-$N(R^b)$-, -C(NOH)-$N(R^b)$-, alkyl, alkenyl, carbonylalkyl, alkylcarbonyl, and a bond, wherein:

any alkyl or alkenyl portion of a substituent in such group optionally is substituted with one or more independently selected R^c substituents; and

Y is selected from the group consisting of hydrogen, halogen, cyano, alkyl, alkenyl, alkynyl, alkoxyalkyl, alkoxyalkoxyalkyl, alkylthioalkyl, alkylthioalkylthioalkyl, alkylthioalkoxyalkyl, alkoxyalkylthioalkyl, carbocyclyl, carbocyclylalkyl, carbocyclylalkoxyalkyl, heterocyclyl, heterocyclylalkyl, and heterocyclylalkoxyalkyl, wherein:

any member of such group optionally is substituted with one or more independently selected R^d substituents; and

each R^a is independently selected from the group consisting of hydrogen, hydroxy, alkyl, alkenyl, alkynyl, alkoxy, alkoxyalkyl, bisalkoxyalkyl, alkylthioalkyl, alkylthioalkenyl, alkylsulfoxidoalkyl, alkylsulfonyl, alkylsulfonylalkyl, carbocyclyl, carbocyclylalkyl, carbocyclyloxyalkyl, carbocyclylalkoxyalkyl, carbocyclylthioalkyl, carbocyclylthioalkenyl, carbocyclylsulfoxidoalkyl, carbocyclylsulfonyl, carbocyclylsulfonylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclyloxyalkyl, heterocyclylalkoxyalkyl, heterocyclylthioalkyl, heterocyclylsulfoxidoalkyl, heterocyclylsulfonyl, heterocyclylsulfonylalkyl, aminoalkyl, aminosulfonyl, aminoalkylsulfonyl, and alkoxyalkylaminoalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkylcarbonyl, carbocyclyl, and carbocyclylalkyl; and

each R^b is independently selected aryl; and

each R^c is independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, -C(H)(NH), -C(H)(NOH), thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkenyl, alkynyl, alkoxyalkyl, alkylthio, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, and carbocyclylalkyl; and

each R^d is independently selected from the group consisting of halogen, hydroxy, cyano, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkoxyalkyl, -C(O)(R^g), -S-R^e, -S(O)$_2$-R^e, carbocyclyl, alkylcarbocyclyl, carbocyclylalkyl, heterocyclyl, alkylheterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^e is independently selected from the group consisting of hydrogen alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^g is independently selected from the group consisting of hydrogen, alkyl, -O-R^h, carbocyclylalkyl, and heterocyclylalkyl; and

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

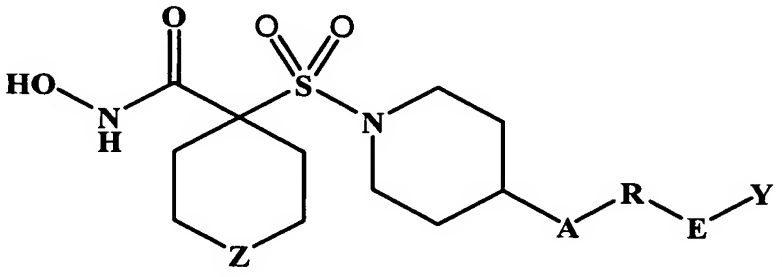
each R^h is independently selected from the group consisting of hydrogen, alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino.

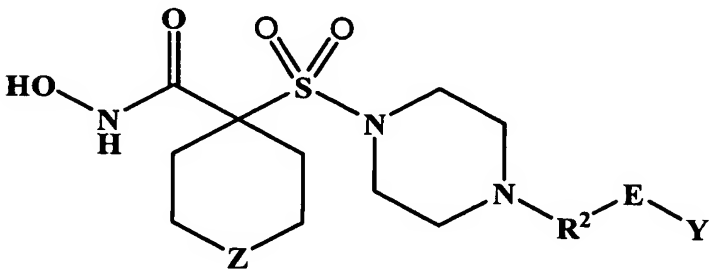
36. A process according to claim 35, wherein R^{x1} is selected from the group consisting of alkoxyalkyl, alkoxycarbonyl, and arylalkoxycarbonyl.

37. A process according to claim 35, wherein:

the hydroxamic acid compound corresponds in structure to a formula selected from the group consisting of:

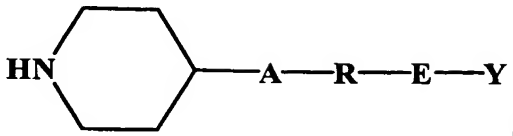


(37-1), and

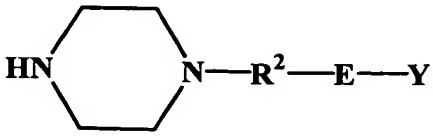


(37-2); and

the cyclic amino compound corresponds in structure to a formula selected from the group consisting of:



(37-3), and



(37-4); and

R^2 is selected from the group consisting of aryl and heteroaryl, wherein:

the aryl or heteroaryl optionally is substituted with one or more substituents independently selected from the group consisting of halogen, nitro, nitroso, hydroxy, alkyl, alkoxy, alkylthio, alkoxyalkyl, alkoxycarbonylalkyl, C_1-C_2-alkylenedioxy, and alkoxycarbonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino.

38. A process according to claim 37, wherein:

R and R^2 are optionally-substituted aryl; and

A is selected from the group consisting of -O-, -S-, -$S(O)_2$-, -O-$S(O)_2$-, -$S(O)_2$-O-, -C(O)-, -C(O)-O-, -O-C(O)-, and a bond; and

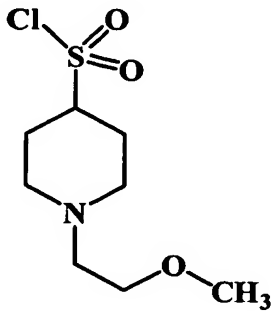
E is selected from the group consisting of -O-, -C(O)-, and a bond.

39. A process according to claim 38, wherein:

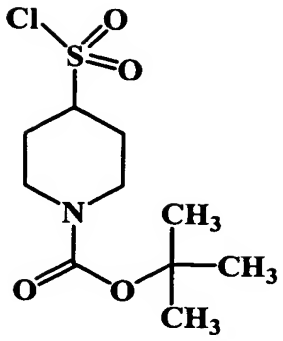
X^1 is -$N(R^{x1})$-; and

R^{x1} is selected from the group consisting of alkoxyalkyl, alkoxycarbonyl, and arylalkoxycarbonyl.

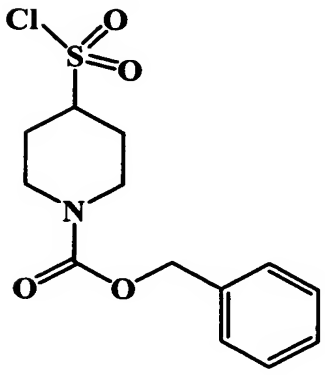
40. A process according to claim 39, wherein the 4-halosulfur-heterocyclyl compound corresponds in structure to Formula (40-1):



(40-1),

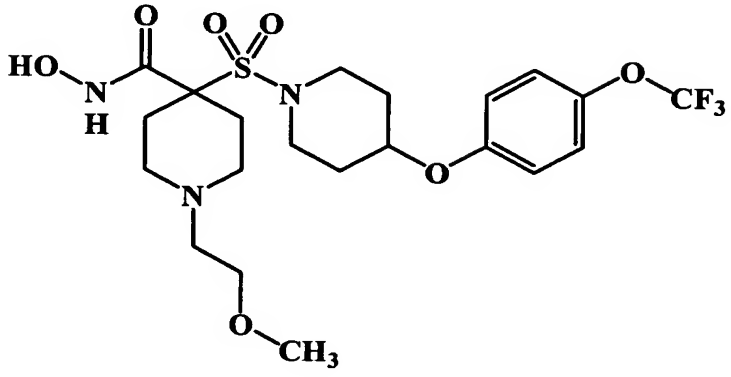


(40-2), and



(40-3).

41. A process according to claim 37, wherein the hydroxamic acid compound corresponds in structure to Formula (41-1):



(41-1).

42. A process according to claim 38, wherein:

the cyclic amino compound is prepared by a process comprising a reaction wherein a reagent is 4-hydroxy-piperidine, and

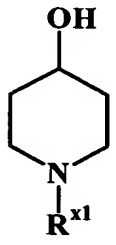
the 4-halosulfur-heterocyclyl compound is prepared by a process comprising a reaction wherein a reagent is 4-hydroxy-piperidine.

43. A process according to claim 38, wherein:

the cyclic amino compound is prepared by a process comprising a reaction wherein a reagent is a first amount of a protected 4-hydroxy-piperidinyl compound; and

the 4-halosulfur-heterocyclyl compound is prepared by a process comprising a reaction wherein a reagent is a second amount of the protected 4-hydroxy-piperidinyl compound; and

the protected 4-hydroxy-piperidinyl compound corresponds in structure to Formula (43-1):



(43-1); and

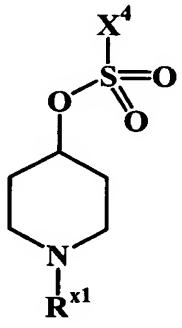
R^{x1} is selected from the group consisting of alkoxycarbonyl and arylalkoxycarbonyl.

44. A process according to claim 38, wherein:

the cyclic amino compound is prepared by a process comprising a reaction wherein a reagent is a first amount of a 4-sulfonyloxy-piperidinyl compound; and

the 4-halosulfur-heterocyclyl compound is prepared by a process comprising a reaction wherein a reagent is a second amount of the 4-sulfonyloxy-piperidinyl compound; and

the 4-sulfonyloxy-piperidinyl compound corresponds in structure to Formula (44-1):



(44-1); and

R^{x1} is selected from the group consisting of alkoxycarbonyl and arylalkoxycarbonyl; and

X^4 is selected from the group consisting of alkyl, haloalkyl, aryl, and haloaryl.

45. A process according to claim 44, wherein:

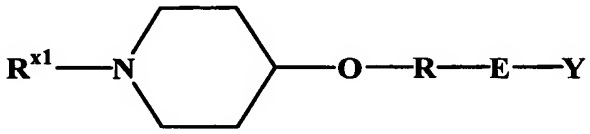
the cyclic amino compound is prepared by a process comprising:

reacting the 4-sulfonyloxy-heterocyclyl compound with an alcohol to form a protected cyclic amino compound having a nitrogen protecting group (R^{x1}), and

removing the nitrogen protecting group from the protected cyclic amino compound; and

the alcohol is HO-R-E-Y; and

the protected cyclic amino compound corresponds in structure to Formula (45-1):



(45-1).

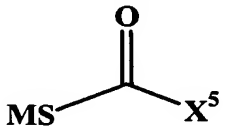
46. A process according to claim 44, wherein:

the 4-halosulfur-heterocyclyl compound is prepared by a process comprising:

reacting the 4-sulfonyloxy-heterocyclyl compound with a metal thioester to form a 4-thioester-heterocyclyl compound, and

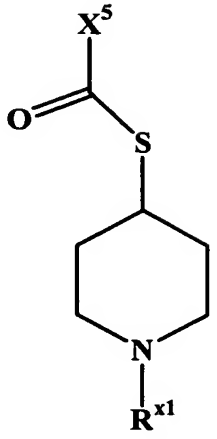
oxidatively halogenating the 4-thioester-heterocyclyl compound; and

the metal thioester corresponds in structure to Formula (46-1):



(46-1); and

the 4-thioester-heterocyclyl compound corresponds in structure to Formula (46-2):



(46-2); and

M is a metal cation; and

X^5 is selected from the group consisting of alkyl, aryl, and arylalkyl, wherein:

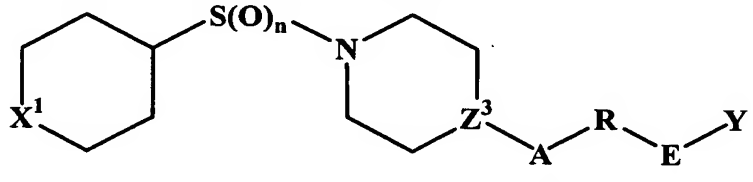
the alkyl, aryl, and arylalkyl are optionally substituted with one or more independently selected halogen.

47. A process according to claim 46, wherein the oxidative halogenation comprises combining the 4-thioester-heterocyclyl compound with a source of Cl_2, N-chlorosuccinimide, or 1,3-dichloro-5,5-dimethylhydantoin.

48. A process for making an sulfuramine compound, wherein:

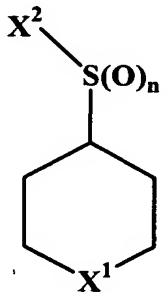
the process comprises reacting a 4-halosulfur-heterocyclyl compound with a cyclic amino compound; and

the sulfuramine compound corresponds in structure to Formula (48-1):



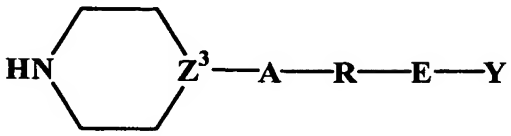
(48-1); and

the 4-halosulfur-heterocyclyl compound corresponds in structure to Formula (48-2):



(48-2); and

the cyclic amino compound corresponds in structure to Formula (48-3):



(48-3); and

each n is independently selected from the group consisting of zero, 1, and 2; and

Z^3 is selected from the group consisting of nitrogen and carbon bonded to hydrogen; and

X^1 is selected from the group consisting of -O-, -S-, -S(O)-, $-S(O)_2-$, and $-N(R^{x1})-$; and

X^2 is halogen; and

R^{x1} is a nitrogen-protecting group; and

A is selected from the group consisting of -O-, -S-, -S(O)-, $-S(O)_2-$, -C(O)-, $-NR^b-$, $-CO-N(R^b)$, $-N(R^b)-C(O)-$, -C(O)-O-, -O-C(O)-, -O-C(O)-O-, -HC=CH-, -C≡C-, -N=N-, $-C(S)-N(R^b)-$, $-N(R^b)-C(S)-$, alkyl, alkoxy, oxyalkyl, alkylthio, thioalkyl, and a bond; and

R is selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxyalkyl, carbocyclyl, heterocyclyl, carbocyclylalkyl, heterocyclylalkyl, carbocyclyloxyalkyl, heterocyclyloxyalkyl, carbocyclylthioalkyl, and heterocyclylthioalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, nitro, nitroso, hydroxy, oxo, alkyl, alkoxy, alkylthio, alkoxyalkyl, alkoxycarbonylalkyl, C_1-C_2-alkylenedioxy, and alkoxycarbonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

E is selected from the group consisting of -O-, -C(O)-, -C(O)-O-, -O-C(O)-, $-N(R^b)-$, $-C(O)-N(R^b)-$, $-N(R^b)-C(O)-$, $-C(O)-N(R^b)-N(R^b)-C(O)-$, $-N(R^b)-C(O)-N(R^b)-$, -S-, -S(O)-, $-S(O)_2-$, $-N(R^b)-S(O)_2-$, $-S(O)_2-N(R^b)-$, $-O-S(O)_2-$, $-S(O)_2-O-$, -C(NH)-, -C(NOH)-, $-N(R^b)-C(NH)-$, $-N(R^b)-C(NOH)-$, $-C(NH)-N(R^b)-$, $-C(NOH)-N(R^b)-$, alkyl, alkenyl, carbonylalkyl, alkylcarbonyl, and a bond, wherein:

any alkyl or alkenyl portion of a substituent in such group optionally is substituted with one or more independently selected R^c substituents; and

Y is selected from the group consisting of hydrogen, halogen, cyano, alkyl, alkenyl, alkynyl, alkoxyalkyl, alkoxyalkoxyalkyl, alkylthioalkyl, alkylthioalkylthioalkyl, alkylthioalkoxyalkyl, alkoxyalkylthioalkyl, carbocyclyl, carbocyclylalkyl, carbocyclylalkoxyalkyl, heterocyclyl, heterocyclylalkyl, and heterocyclylalkoxyalkyl, wherein:

any member of such group optionally is substituted with one or more independently selected R^d substituents; and

each R^b is independently selected aryl; and

each R^c is independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, -C(H)(NH), -C(H)(NOH), thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkenyl, alkynyl, alkoxyalkyl, alkylthio, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, and carbocyclylalkyl; and

each R^d is independently selected from the group consisting of halogen, hydroxy, cyano, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkoxyalkyl, -C(O)(R^g), -S-R^e, -S(O)$_2$-R^e, carbocyclyl, alkylcarbocyclyl, carbocyclylalkyl, heterocyclyl, alkylheterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^e is independently selected from the group consisting of hydrogen alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

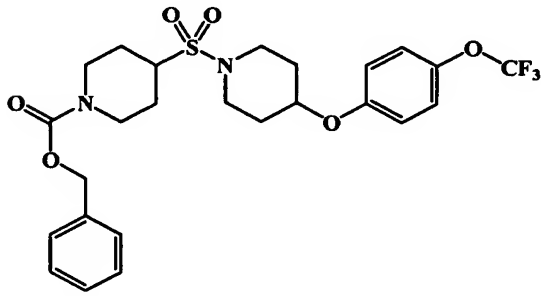
each R^g is independently selected from the group consisting of hydrogen, alkyl, -O-R^h, carbocyclylalkyl, and heterocyclylalkyl; and

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^h is independently selected from the group consisting of hydrogen, alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

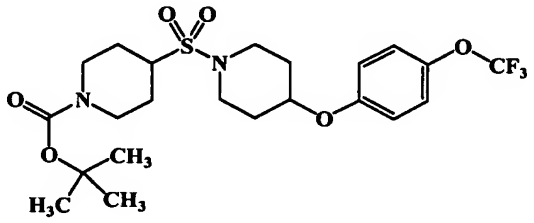
any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino.

49. A process according to claim 48, wherein the sulfuramine compound corresponds in structure to Formula (49-1):



(49-1)

and

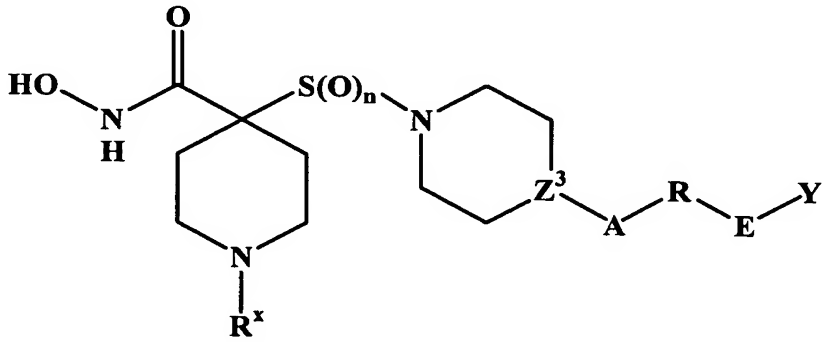


(49-2).

50. A process for making a hydroxamic acid compound or a salt thereof, wherein:

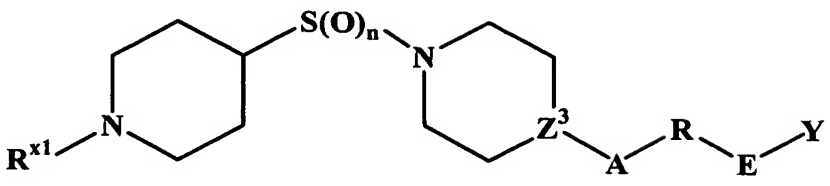
the process comprises removing a nitrogen-protecting group (R^{x1}) from a piperidinyl nitrogen of a nitrogen-protected piperidinyl compound; and

the hydroxamic acid compound corresponds in structure to Formula (50-1):



(50-1); and

the nitrogen-protected piperidinyl compound corresponds in structure to Formula (50-2):



(50-2); and

Z^3 is selected from the group consisting of nitrogen and carbon bonded to hydrogen; and

each n is independently selected from the group consisting of zero, 1, and 2; and

R^x is selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, R^a-oxyalkyl, alkylsulfonyl, aminosulfonyl, R^aR^a-aminoalkyl, carbocyclyl, carbocyclylalkyl, carbocyclylsulfonyl, heterocyclyl, heterocyclylalkyl, and heterocyclylsulfonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, amino, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkylthio, alkoxyalkyl, and alkoxyalkoxy, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, and alkyl; and

A is selected from the group consisting of -O-, -S-, -S(O)-, $-S(O)_2-$, -C(O)-, $-NR^b-$, $-CO-N(R^b)$, $-N(R^b)-C(O)-$, -C(O)-O-, -O-C(O)-, -O-C(O)-O-, -HC=CH-, -C≡C-, -N=N-, $-C(S)-N(R^b)-$, $-N(R^b)-C(S)-$, alkyl, alkoxy, oxyalkyl, alkylthio, thioalkyl, and a bond; and

R is selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxyalkyl, carbocyclyl, heterocyclyl, carbocyclylalkyl, heterocyclylalkyl, carbocyclyloxyalkyl, heterocyclyloxyalkyl, carbocyclylthioalkyl, and heterocyclylthioalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, nitro, nitroso, hydroxy, oxo, alkyl, alkoxy, alkylthio, alkoxyalkyl, alkoxycarbonylalkyl, C_1-C_2-alkylenedioxy, and alkoxycarbonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

E is selected from the group consisting of -O-, -C(O)-, -C(O)-O-, -O-C(O)-, -N(R^b)-, -C(O)-N(R^b)-, -N(R^b)-C(O)-, -C(O)-N(R^b)-N(R^b)-C(O)-, -N(R^b)-C(O)-N(R^b)-, -S-, -S(O)-, -$S(O)_2$-, -N(R^b)-$S(O)_2$-, -$S(O)_2$-N(R^b)-, -O-$S(O)_2$-, -$S(O)_2$-O-, -C(NH)-, -C(NOH)-, -N(R^b)-C(NH)-, -N(R^b)-C(NOH)-, -C(NH)-N(R^b)-, -C(NOH)-N(R^b)-, alkyl, alkenyl, carbonylalkyl, alkylcarbonyl, and a bond, wherein:

any alkyl or alkenyl portion of a substituent in such group optionally is substituted with one or more independently selected R^c substituents; and

Y is selected from the group consisting of hydrogen, halogen, cyano, alkyl, alkenyl, alkynyl, alkoxyalkyl, alkoxyalkoxyalkyl, alkylthioalkyl, alkylthioalkylthioalkyl, alkylthioalkoxyalkyl, alkoxyalkylthioalkyl, carbocyclyl, carbocyclylalkyl, carbocyclylalkoxyalkyl, heterocyclyl, heterocyclylalkyl, and heterocyclylalkoxyalkyl, wherein:

any member of such group optionally is substituted with one or more independently selected R^d substituents; and

each R^a is independently selected from the group consisting of hydrogen, hydroxy, alkyl, alkenyl, alkynyl, alkoxy, alkoxyalkyl, bisalkoxyalkyl, alkylthioalkyl, alkylthioalkenyl, alkylsulfoxidoalkyl, alkylsulfonyl, alkylsulfonylalkyl, carbocyclyl, carbocyclylalkyl, carbocyclyloxyalkyl, carbocyclylalkoxyalkyl, carbocyclylthioalkyl, carbocyclylthioalkenyl, carbocyclylsulfoxidoalkyl, carbocyclylsulfonyl, carbocyclylsulfonylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclyloxyalkyl, heterocyclylalkoxyalkyl, heterocyclylthioalkyl, heterocyclylsulfoxidoalkyl, heterocyclylsulfonyl, heterocyclylsulfonylalkyl, aminoalkyl, aminosulfonyl, aminoalkylsulfonyl, and alkoxyalkylaminoalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkylcarbonyl, carbocyclyl, and carbocyclylalkyl; and

each R^b is independently selected aryl; and

each R^c is independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, -C(H)(NH), -C(H)(NOH), thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkenyl, alkynyl, alkoxyalkyl, alkylthio, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, and carbocyclylalkyl; and

each R^d is independently selected from the group consisting of halogen, hydroxy, cyano, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkoxyalkyl, -C(O)(R^g), -S-R^e, -S(O)$_2$-R^e, carbocyclyl, alkylcarbocyclyl, carbocyclylalkyl, heterocyclyl, alkylheterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^e is independently selected from the group consisting of hydrogen alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^g is independently selected from the group consisting of hydrogen, alkyl, -O-R^h, carbocyclylalkyl, and heterocyclylalkyl; and

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

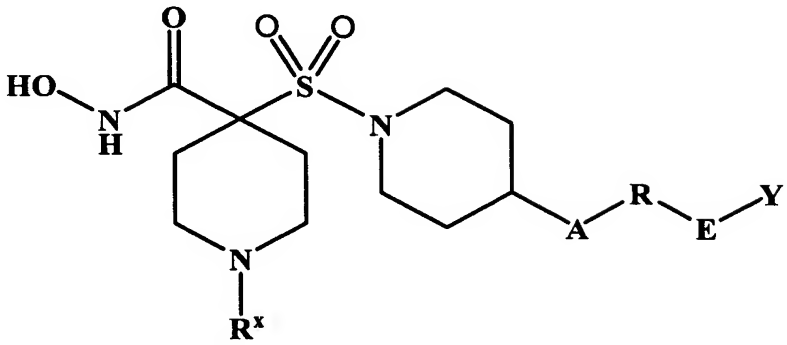
each R^h is independently selected from the group consisting of hydrogen, alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino.

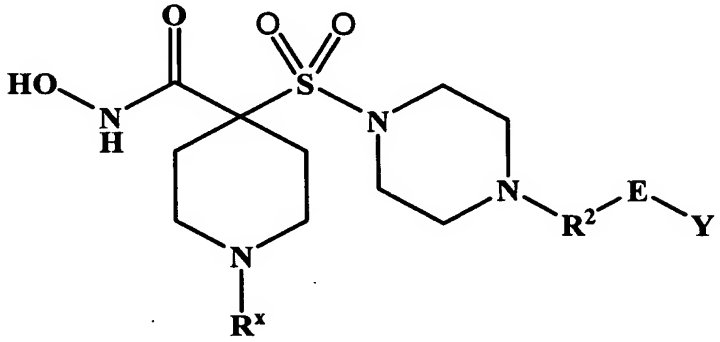
51. A process according to claim 50, wherein R^{x1} is selected from the group consisting of alkoxycarbonyl and arylalkoxycarbonyl.

52. A process according to claim 50, wherein:

the hydroxamic acid compound corresponds in structure to a formula selected from the group consisting of:

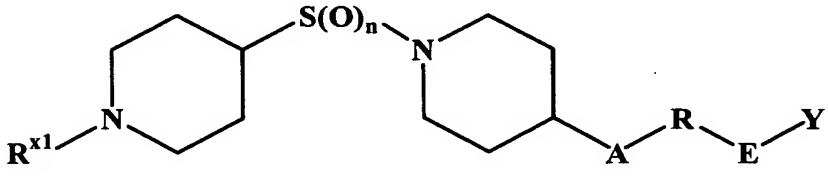


(52-1), and

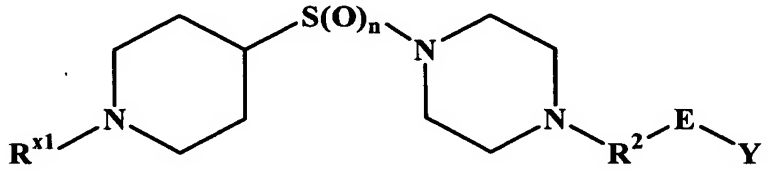


(52-2); and

the nitrogen-protected piperidinyl compound corresponds in structure to a formula selected from the group consisting of:



(52-3), and



(52-4); and

R^2 is selected from the group consisting of aryl and heteroaryl, wherein:

the aryl or heteroaryl optionally is substituted with one or more substituents independently selected from the group consisting of halogen, nitro, nitroso, hydroxy, alkyl, alkoxy, alkylthio, alkoxyalkyl, alkoxycarbonylalkyl, C_1-C_2-alkylenedioxy, and alkoxycarbonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino.

53. A process according to claim 52, wherein the process comprises contacting the nitrogen-protected piperidinyl compound with a hydrogen source and a transition metal catalyst.

54. A process according to claim 53, wherein the hydrogen source comprises ammonium formate.

55. A process according to claim 52, wherein the process comprises contacting the nitrogen-protected piperidinyl compound with an acid.

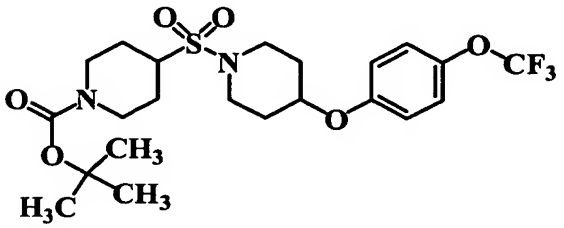
56. A process according to claim 55, wherein the acid has a pKa of no greater than about -3.

57. A process according to claim 55, wherein contacting of the nitrogen-protected piperidinyl compound with the acid occurs at a temperature of greater than 30°C.

58. A process according to claim 56, wherein the acid comprises HCl gas.

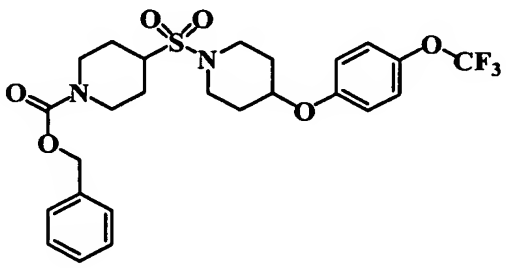
59. A process according to claim 56, wherein the acid comprises HCl in an alcohol.

60. A process according to claim 55, wherein the nitrogen-protected piperidinyl compound corresponds in structure selected from the group consisting of:



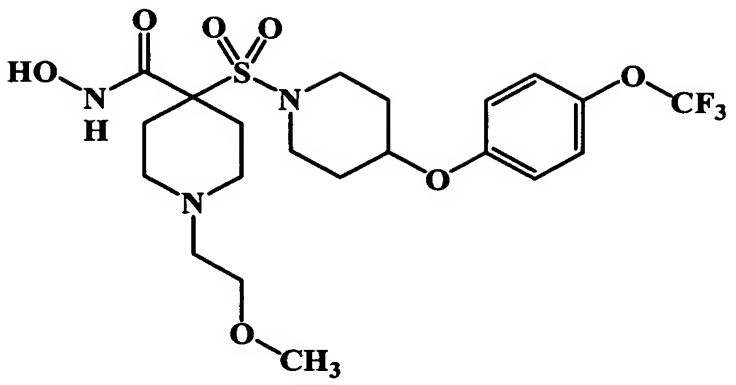
(60-1)

and



(60-2).

61. A process according to claim 52, wherein the hydroxamic acid compound corresponds in structure to Formula (61-1):

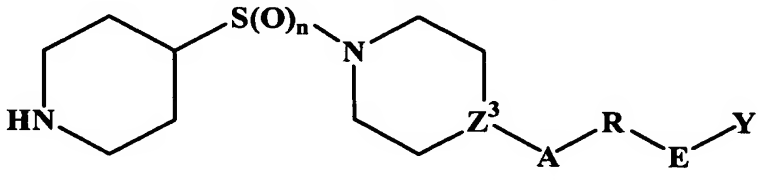


(61-1).

62. A process for making an unprotected piperidinyl compound, wherein:

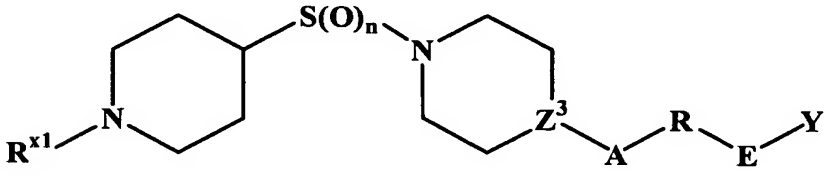
the process comprises removing a nitrogen-protecting group (R^{x1}) from a piperidinyl nitrogen of a nitrogen-protected piperidinyl compound; and

the unprotected piperidinyl compound corresponds in structure to Formula (62-1):



(62-1); and

the nitrogen-protected piperidinyl compound corresponds in structure to Formula (62-2):



(62-2); and

Z^3 is selected from the group consisting of nitrogen and carbon bonded to hydrogen; and

each n is independently selected from the group consisting of zero, 1, and 2; and

A is selected from the group consisting of -O-, -S-, -S(O)-, $-S(O)_2-$, -C(O)-, $-NR^b-$, $-CO-N(R^b)$, $-N(R^b)-C(O)-$, -C(O)-O-, -O-C(O)-, -O-C(O)-O-, -HC=CH-, -C≡C-, -N=N-, $-C(S)-N(R^b)-$, $-N(R^b)-C(S)-$, alkyl, alkoxy, oxyalkyl, alkylthio, thioalkyl, and a bond; and

R is selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxyalkyl, carbocyclyl, heterocyclyl, carbocyclylalkyl, heterocyclylalkyl, carbocyclyloxyalkyl, heterocyclyloxyalkyl, carbocyclylthioalkyl, and heterocyclylthioalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, nitro,

nitroso, hydroxy, oxo, alkyl, alkoxy, alkylthio, alkoxyalkyl, alkoxycarbonylalkyl, C_1-C_2-alkylenedioxy, and alkoxycarbonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

E is selected from the group consisting of -O-, -C(O)-, -C(O)-O-, -O-C(O)-, -N(R^b)-, -C(O)-N(R^b)-, -N(R^b)-C(O)-, -C(O)-N(R^b)-N(R^b)-C(O)-, -N(R^b)-C(O)-N(R^b)-, -S-, -S(O)-, -$S(O)_2$-, -N(R^b)-$S(O)_2$-, -$S(O)_2$-N(R^b)-, -O-$S(O)_2$-, -$S(O)_2$-O-, -C(NH)-, -C(NOH)-, -N(R^b)-C(NH)-, -N(R^b)-C(NOH)-, -C(NH)-N(R^b)-, -C(NOH)-N(R^b)-, alkyl, alkenyl, carbonylalkyl, alkylcarbonyl, and a bond, wherein:

any alkyl or alkenyl portion of a substituent in such group optionally is substituted with one or more independently selected R^c substituents; and

Y is selected from the group consisting of hydrogen, halogen, cyano, alkyl, alkenyl, alkynyl, alkoxyalkyl, alkoxyalkoxyalkyl, alkylthioalkyl, alkylthioalkylthioalkyl, alkylthioalkoxyalkyl, alkoxyalkylthioalkyl, carbocyclyl, carbocyclylalkyl, carbocyclylalkoxyalkyl, heterocyclyl, heterocyclylalkyl, and heterocyclylalkoxyalkyl, wherein:

any member of such group optionally is substituted with one or more independently selected R^d substituents; and

each R^b is independently selected aryl; and

each R^c is independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, -C(H)(NH), -C(H)(NOH), thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkenyl, alkynyl, alkoxyalkyl, alkylthio, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, and carbocyclylalkyl; and

each R^d is independently selected from the group consisting of halogen, hydroxy, cyano, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkoxyalkyl, -C(O)(R^g), -S-R^e, -$S(O)_2$-R^e, carbocyclyl, alkylcarbocyclyl, carbocyclylalkyl, heterocyclyl, alkylheterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^e is independently selected from the group consisting of hydrogen alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

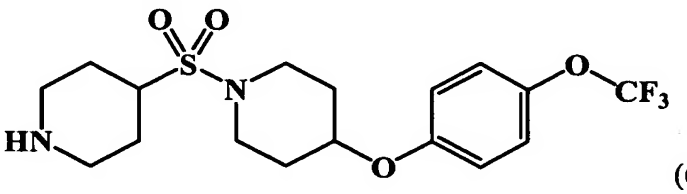
each R^g is independently selected from the group consisting of hydrogen, alkyl, -O-R^h, carbocyclylalkyl, and heterocyclylalkyl; and

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^h is independently selected from the group consisting of hydrogen, alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino.

63. A process according to claim 62, wherein the unprotected piperidinyl compound corresponds in structure to Formula (63-1):

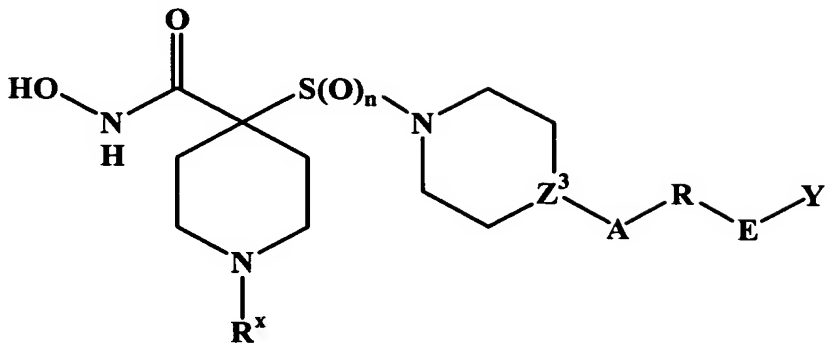


(63-1).

64. A process for making a hydroxamic acid compound or a salt thereof, wherein:

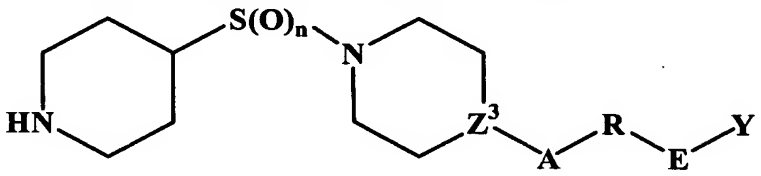
the process comprises contacting an unprotected piperidinyl compound with an N-alkylating agent; and

the hydroxamic acid compound corresponds in structure to Formula (64-1):



(64-1); and

the unprotected piperidinyl compound corresponds in structure to Formula (64-2):



(64-2); and

Z^3 is selected from the group consisting of nitrogen and carbon bonded to hydrogen; and

each n is independently selected from the group consisting of zero, 1, and 2; and

A is selected from the group consisting of -O-, -S-, -S(O)-, $-S(O)_2-$, -C(O)-, $-NR^b-$, $-CO-N(R^b)$, $-N(R^b)-C(O)-$, -C(O)-O-, -O-C(O)-, -O-C(O)-O-, -HC=CH-, -C≡C-, -N=N-, $-C(S)-N(R^b)-$, $-N(R^b)-C(S)-$, alkyl, alkoxy, oxyalkyl, alkylthio, thioalkyl, and a bond; and

R is selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxyalkyl, carbocyclyl, heterocyclyl, carbocyclylalkyl, heterocyclylalkyl, carbocyclyloxyalkyl, heterocyclyloxyalkyl, carbocyclylthioalkyl, and heterocyclylthioalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, nitro, nitroso, hydroxy, oxo, alkyl, alkoxy, alkylthio, alkoxyalkyl, alkoxycarbonylalkyl, C_1-C_2-alkylenedioxy, and alkoxycarbonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

E is selected from the group consisting of -O-, -C(O)-, -C(O)-O-, -O-C(O)-, $-N(R^b)-$, $-C(O)-N(R^b)-$, $-N(R^b)-C(O)-$, $-C(O)-N(R^b)-N(R^b)-C(O)-$, $-N(R^b)-C(O)-N(R^b)-$, -S-, -S(O)-, $-S(O)_2-$, $-N(R^b)-S(O)_2-$, $-S(O)_2-N(R^b)-$, $-O-S(O)_2-$, $-S(O)_2-O-$, -C(NH)-,

-C(NOH)-, -N(R^b)-C(NH)-, -N(R^b)-C(NOH)-, -C(NH)-N(R^b)-, -C(NOH)-N(R^b)-, alkyl, alkenyl, carbonylalkyl, alkylcarbonyl, and a bond, wherein:

any alkyl or alkenyl portion of a substituent in such group optionally is substituted with one or more independently selected R^c substituents; and

Y is selected from the group consisting of hydrogen, halogen, cyano, alkyl, alkenyl, alkynyl, alkoxyalkyl, alkoxyalkoxyalkyl, alkylthioalkyl, alkylthioalkylthioalkyl, alkylthioalkoxyalkyl, alkoxyalkylthioalkyl, carbocyclyl, carbocyclylalkyl, carbocyclylalkoxyalkyl, heterocyclyl, heterocyclylalkyl, and heterocyclylalkoxyalkyl, wherein:

any member of such group optionally is substituted with one or more independently selected R^d substituents; and

R^x is alkyl optionally substituted with a substituent selected from the group consisting of R^a-oxy, R^aR^a-amino (wherein each R^a is other than hydrogen), carbocyclyl, and heterocyclyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkoxy, alkylthio, and alkoxyalkoxy, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, and alkyl; and

each R^a is independently selected from the group consisting of hydrogen, alkyl, alkoxyalkyl, bisalkoxyalkyl, alkylthioalkyl, alkylsulfoxidoalkyl, alkylsulfonyl, alkylsulfonylalkyl, carbocyclyl, carbocyclylalkyl, carbocyclyloxyalkyl, carbocyclylalkoxyalkyl, carbocyclylthioalkyl, carbocyclylsulfoxidoalkyl, carbocyclylsulfonyl, carbocyclylsulfonylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclyloxyalkyl, heterocyclylalkoxyalkyl, heterocyclylthioalkyl, heterocyclylsulfoxidoalkyl, heterocyclylsulfonyl, and heterocyclylsulfonylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkylcarbonyl, carbocyclyl, and carbocyclylalkyl; and

each R^b is independently selected aryl; and

each R^c is independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, -C(H)(NH), -C(H)(NOH), thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkenyl, alkynyl, alkoxyalkyl, alkylthio, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, and carbocyclylalkyl; and

each R^d is independently selected from the group consisting of halogen, hydroxy, cyano, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkoxyalkyl, -C(O)(R^g), -S-R^e, -S(O)$_2$-R^e, carbocyclyl, alkylcarbocyclyl, carbocyclylalkyl, heterocyclyl, alkylheterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^e is independently selected from the group consisting of hydrogen alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^g is independently selected from the group consisting of hydrogen, alkyl, -O-R^h, carbocyclylalkyl, and heterocyclylalkyl; and

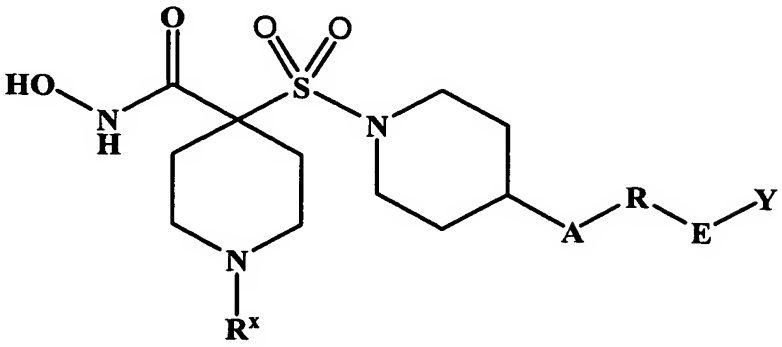
any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^h is independently selected from the group consisting of hydrogen, alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

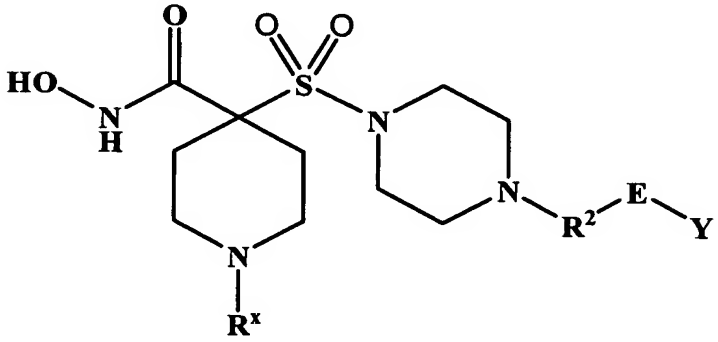
any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino.

65. A process according to claim 64, wherein:

the hydroxamic acid compound corresponds in structure to a formula selected from the group consisting of:

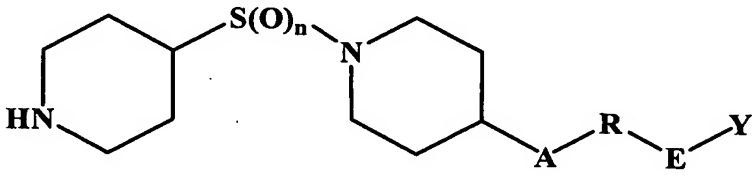


(65-1), and

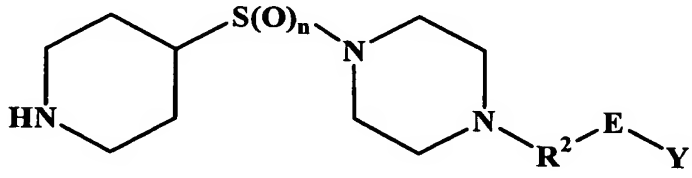


(65-2); and

the unprotected piperidinyl compound corresponds in structure to a formula selected from the group consisting of:



(65-3), and



(65-4); and

R^2 is selected from the group consisting of aryl and heteroaryl, wherein:

the aryl or heteroaryl optionally is substituted with one or more substituents independently selected from the group consisting of halogen, nitro, nitroso, hydroxy, alkyl, alkoxy, alkylthio, alkoxyalkyl, alkoxycarbonylalkyl, C_1-C_2-alkylenedioxy, and alkoxycarbonyl, wherein:

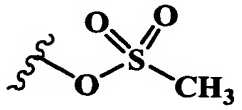
any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of

halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino.

66. A process according to claim 65, wherein:

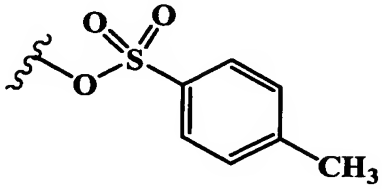
the N-alkylating agent is R^x-X^3; and

X^3 is halogen or corresponds in structure to a formula selected from the group consisting of:



(66-1)

and



(66-2).

67. A process according to claim 66, wherein X^3 is halogen.

68. A process according to claim 67, wherein contacting of the unprotected piperidinyl compound with the N-alkylating agent occurs at a temperature of greater than 30°C.

69. A process according to claim 67, wherein contacting of the unprotected piperidinyl compound with the N-alkylating agent occurs in the presence of base.

70. A process according to claim 69, wherein the base comprises potassium carbonate.

71. A process according to claim 67, wherein:

X^3 is bromo, and

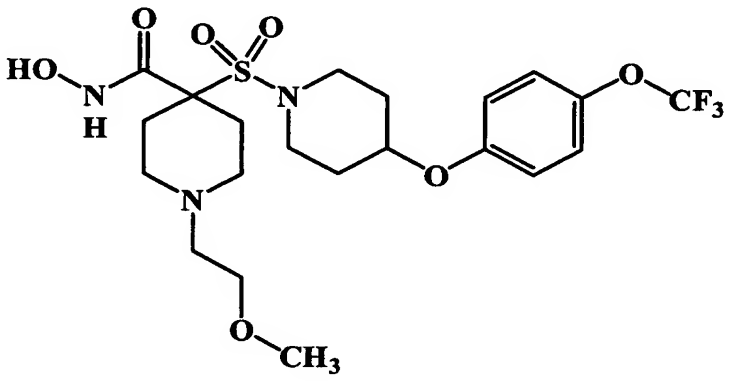
contacting of the unprotected piperidinyl compound with the N-alkylating agent occurs at a temperature of from about 50 to about 60°C.

72. A process according to claim 67, wherein:

X^3 is chloro, and

contacting of the unprotected piperidinyl compound with the N-alkylating agent occurs at a temperature of greater than about 60°C.

73. A process according to claim 67, wherein the hydroxamic acid compound corresponds in structure to Formula (73-1):

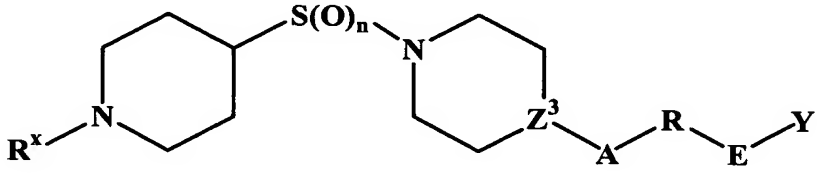


(73-1).

74. A process for making an alkylated piperidinyl compound or a salt thereof, wherein:

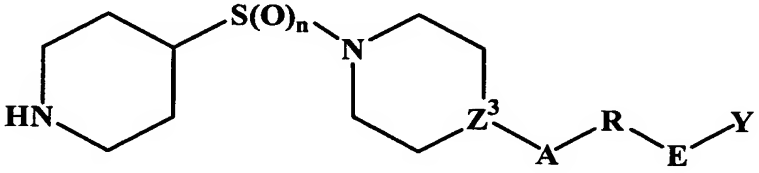
the process comprises contacting an unprotected piperidinyl compound with an N-alkylating agent; and

the alkylated piperidinyl compound corresponds in structure to Formula (74-1):



(74-1); and

the unprotected piperidinyl compound corresponds in structure to Formula (74-2):



(74-2); and

Z^3 is selected from the group consisting of nitrogen and carbon bonded to hydrogen; and

each n is independently selected from the group consisting of zero, 1, and 2; and

A is selected from the group consisting of -O-, -S-, -S(O)-, $-S(O)_2-$, -C(O)-, $-NR^b-$, $-CO-N(R^b)$, $-N(R^b)-C(O)-$, -C(O)-O-, -O-C(O)-, -O-C(O)-O-, -HC=CH-, -C≡C-, -N=N-, $-C(S)-N(R^b)-$, $-N(R^b)-C(S)-$, alkyl, alkoxy, oxyalkyl, alkylthio, thioalkyl, and a bond; and

R is selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxyalkyl, carbocyclyl, heterocyclyl, carbocyclylalkyl, heterocyclylalkyl, carbocyclyloxyalkyl, heterocyclyloxyalkyl, carbocyclylthioalkyl, and heterocyclylthioalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, nitro, nitroso, hydroxy, oxo, alkyl, alkoxy, alkylthio, alkoxyalkyl, alkoxycarbonylalkyl, C_1-C_2-alkylenedioxy, and alkoxycarbonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

E is selected from the group consisting of -O-, -C(O)-, -C(O)-O-, -O-C(O)-, -N(R^b)-, -C(O)-N(R^b)-, -N(R^b)-C(O)-, -C(O)-N(R^b)-N(R^b)-C(O)-, -N(R^b)-C(O)-N(R^b)-, -S-, -S(O)-, -S$(O)_2$-, -N(R^b)-S$(O)_2$-, -S$(O)_2$-N(R^b)-, -O-S$(O)_2$-, -S$(O)_2$-O-, -C(NH)-, -C(NOH)-, -N(R^b)-C(NH)-, -N(R^b)-C(NOH)-, -C(NH)-N(R^b)-, -C(NOH)-N(R^b)-, alkyl, alkenyl, carbonylalkyl, alkylcarbonyl, and a bond, wherein:

any alkyl or alkenyl portion of a substituent in such group optionally is substituted with one or more independently selected R^c substituents; and

Y is selected from the group consisting of hydrogen, halogen, cyano, alkyl, alkenyl, alkynyl, alkoxyalkyl, alkoxyalkoxyalkyl, alkylthioalkyl, alkylthioalkylthioalkyl, alkylthioalkoxyalkyl, alkoxyalkylthioalkyl, carbocyclyl, carbocyclylalkyl, carbocyclylalkoxyalkyl, heterocyclyl, heterocyclylalkyl, and heterocyclylalkoxyalkyl, wherein:

any member of such group optionally is substituted with one or more independently selected R^d substituents; and

R^x is alkyl optionally substituted with a substituent selected from the group consisting of R^a-oxy, R^aR^a-amino (wherein each R^a is other than hydrogen), carbocyclyl, and heterocyclyl, wherein:

any member of such group optionally is substituted on any atom capable of such substituent with one or more substituents independently selected from the group consisting of halogen, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkoxy, alkylthio, and alkoxyalkoxy, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, and alkyl; and

each R^a is independently selected from the group consisting of hydrogen, alkyl, alkoxyalkyl, bisalkoxyalkyl, alkylthioalkyl, alkylsulfoxidoalkyl, alkylsulfonyl, alkylsulfonylalkyl, carbocyclyl, carbocyclylalkyl, carbocyclyloxyalkyl, carbocyclylalkoxyalkyl, carbocyclylthioalkyl, carbocyclylsulfoxidoalkyl, carbocyclylsulfonyl, carbocyclylsulfonylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclyloxyalkyl, heterocyclylalkoxyalkyl, heterocyclylthioalkyl, heterocyclylsulfoxidoalkyl, heterocyclylsulfonyl, and heterocyclylsulfonylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkylcarbonyl, carbocyclyl, and carbocyclylalkyl; and

each R^b is independently selected aryl; and

each R^c is independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, -C(H)(NH), -C(H)(NOH), thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkenyl, alkynyl, alkoxyalkyl, alkylthio, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, and carbocyclylalkyl; and

each R^d is independently selected from the group consisting of halogen, hydroxy, cyano, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkoxyalkyl, $-C(O)(R^g)$, $-S-R^e$, $-S(O)_2-R^e$, carbocyclyl, alkylcarbocyclyl, carbocyclylalkyl, heterocyclyl, alkylheterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^e is independently selected from the group consisting of hydrogen alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

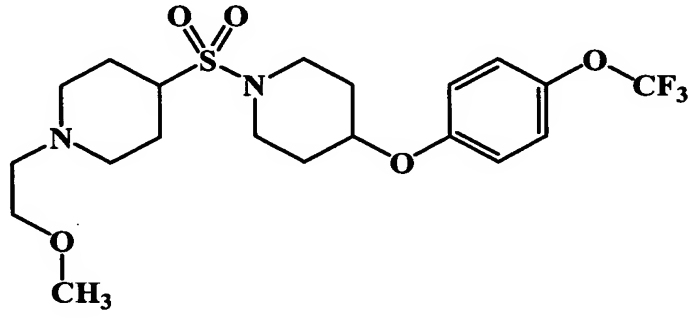
each R^g is independently selected from the group consisting of hydrogen, alkyl, -O-R^h, carbocyclylalkyl, and heterocyclylalkyl; and

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^h is independently selected from the group consisting of hydrogen, alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino.

75. A process according to claim 74, wherein the alkylated piperidinyl compound corresponds in structure to Formula (75-1):

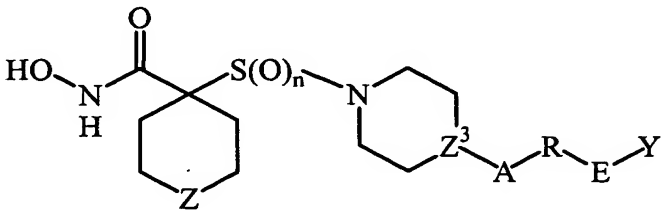


(75-1).

76. A process for making a hydroxamic acid compound or a salt thereof, wherein:

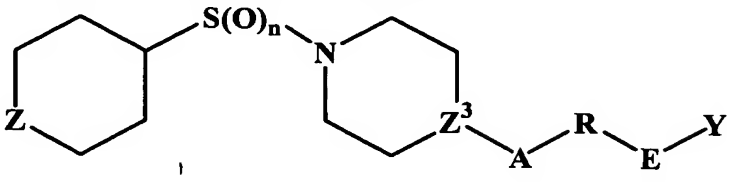
the process comprises contacting a sulfuramine compound with a base to form an anion, and contacting the anion with a carbon dioxide source; and

the hydroxamic acid compound corresponds in structure to Formula (76-1):



(76-1); and

the sulfuramine compound corresponds in structure to Formula (76-2):



(76-2); and

each n is independently selected from the group consisting of zero, 1, and 2; and

Z is selected from the group consisting of -O-, -S-, -S(O)-, -$S(O)_2$-, and -$N(R^x)$-;

and

Z^3 is selected from the group consisting of nitrogen and carbon bonded to hydrogen; and

R^x is selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, R^a-oxyalkyl, alkylsulfonyl, aminosulfonyl, R^aR^a-aminoalkyl, carbocyclyl, carbocyclylalkyl, carbocyclylsulfonyl, heterocyclyl, heterocyclylalkyl, and heterocyclylsulfonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, amino, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkylthio, alkoxyalkyl, and alkoxyalkoxy, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, and alkyl; and

A is selected from the group consisting of -O-, -S-, -S(O)-, -$S(O)_2$-, -C(O)-, -NR^b-, -CO-$N(R^b)$, -$N(R^b)$-C(O)-, -C(O)-O-, -O-C(O)-, -O-C(O)-O-, -HC=CH-, -C≡C-, -N=N-, -C(S)-$N(R^b)$-, -$N(R^b)$-C(S)-, alkyl, alkoxy, oxyalkyl, alkylthio, thioalkyl, and a bond; and

R is selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxyalkyl, carbocyclyl, heterocyclyl, carbocyclylalkyl, heterocyclylalkyl, carbocyclyloxyalkyl, heterocyclyloxyalkyl, carbocyclylthioalkyl, and heterocyclylthioalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, nitro, nitroso, hydroxy, oxo, alkyl, alkoxy, alkylthio, alkoxyalkyl, alkoxycarbonylalkyl, C_1-C_2-alkylenedioxy, and alkoxycarbonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of

halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

E is selected from the group consisting of -O-, -C(O)-, -C(O)-O-, -O-C(O)-, -N(R^b)-, -C(O)-N(R^b)-, -N(R^b)-C(O)-, -C(O)-N(R^b)-N(R^b)-C(O)-, -N(R^b)-C(O)-N(R^b)-, -S-, -S(O)-, -S$(O)_2$-, -N(R^b)-S$(O)_2$-, -S$(O)_2$-N(R^b)-, -O-S$(O)_2$-, -S$(O)_2$-O-, -C(NH)-, -C(NOH)-, -N(R^b)-C(NH)-, -N(R^b)-C(NOH)-, -C(NH)-N(R^b)-, -C(NOH)-N(R^b)-, alkyl, alkenyl, carbonylalkyl, alkylcarbonyl, and a bond, wherein:

any alkyl or alkenyl portion of a substituent in such group optionally is substituted with one or more independently selected R^c substituents; and

Y is selected from the group consisting of hydrogen, halogen, cyano, alkyl, alkenyl, alkynyl, alkoxyalkyl, alkoxyalkoxyalkyl, alkylthioalkyl, alkylthioalkylthioalkyl, alkylthioalkoxyalkyl, alkoxyalkylthioalkyl, carbocyclyl, carbocyclylalkyl, carbocyclylalkoxyalkyl, heterocyclyl, heterocyclylalkyl, and heterocyclylalkoxyalkyl, wherein:

any member of such group optionally is substituted with one or more independently selected R^d substituents; and

each R^a is independently selected from the group consisting of hydrogen, hydroxy, alkyl, alkenyl, alkynyl, alkoxy, alkoxyalkyl, bisalkoxyalkyl, alkylthioalkyl, alkylthioalkenyl, alkylsulfoxidoalkyl, alkylsulfonyl, alkylsulfonylalkyl, carbocyclyl, carbocyclylalkyl, carbocyclyloxyalkyl, carbocyclylalkoxyalkyl, carbocyclylthioalkyl, carbocyclylthioalkenyl, carbocyclylsulfoxidoalkyl, carbocyclylsulfonyl, carbocyclylsulfonylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclyloxyalkyl, heterocyclylalkoxyalkyl, heterocyclylthioalkyl, heterocyclylsulfoxidoalkyl, heterocyclylsulfonyl, heterocyclylsulfonylalkyl, aminoalkyl, aminosulfonyl, aminoalkylsulfonyl, and alkoxyalkylaminoalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkylcarbonyl, carbocyclyl, and carbocyclylalkyl; and

each R^b is independently selected aryl; and

each R^c is independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, -C(H)(NH), -C(H)(NOH), thiol, sulfo, nitro, nitroso, oxo, thioxo, imino,

alkyl, alkoxy, alkenyl, alkynyl, alkoxyalkyl, alkylthio, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, and carbocyclylalkyl; and

each R^d is independently selected from the group consisting of halogen, hydroxy, cyano, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkoxyalkyl, $-C(O)(R^g)$, $-S-R^e$, $-S(O)_2-R^e$, carbocyclyl, alkylcarbocyclyl, carbocyclylalkyl, heterocyclyl, alkylheterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^e is independently selected from the group consisting of hydrogen alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^g is independently selected from the group consisting of hydrogen, alkyl, $-O-R^h$, carbocyclylalkyl, and heterocyclylalkyl; and

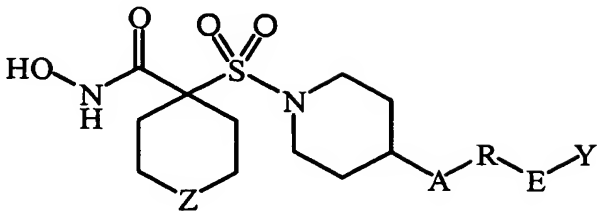
any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

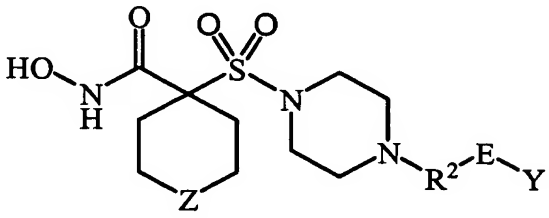
each R^h is independently selected from the group consisting of hydrogen, alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino.

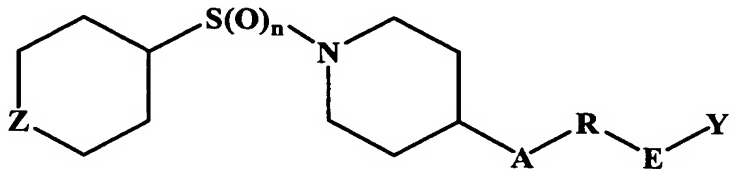
77. A process according to claim 76, wherein:

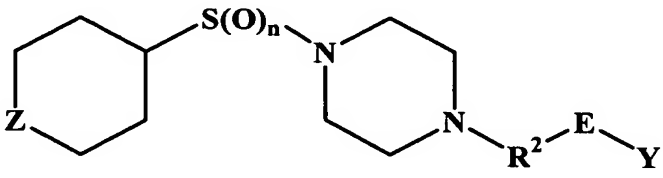
the hydroxamic acid compound corresponds in structure to a formula selected from the group consisting of:


(77-1), and


(77-2); and

the sulfuramine compound corresponds in structure to a formula selected from the group consisting of:


(77-3), and


(77-4); and

R^2 is selected from the group consisting of aryl and heteroaryl, wherein:

the aryl or heteroaryl optionally is substituted with one or more substituents independently selected from the group consisting of halogen, nitro, nitroso, hydroxy, alkyl, alkoxy, alkylthio, alkoxyalkyl, alkoxycarbonylalkyl, C_1-C_2-alkylenedioxy, and alkoxycarbonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino.

78. A process according to claim 77, wherein the base comprises a strong, non-aqueous base.

79. A process according to claim 78, wherein the base comprises alkyllithium.

80. A process according to claim 79, wherein the base comprises butyllithium.

81. A process according to claim 78, wherein the base comprises lithium diisopropylamide.

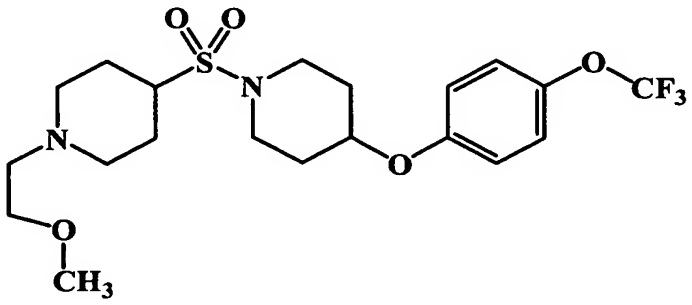
82. A process according to claim 78, wherein contacting of the sulfuramine compound with the base occurs at a temperature of less than 20°C.

83. A process according to claim 78, wherein contacting of the anion with the carbon dioxide source occurs at a temperature of less than 20°C.

84. A process according to claim 78, wherein the source of carbon dioxide comprises methylchloroformate.

85. A process according to claim 78, wherein the source of carbon dioxide comprises CO_2 gas.

86. A process according to claim 85, wherein the sulfuramine compound corresponds in structure to Formula (86-1):

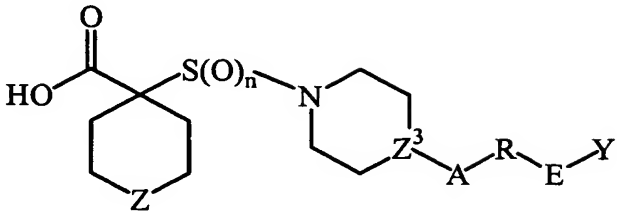


(86-1).

87. A process for making a carboxylic acid compound, wherein:

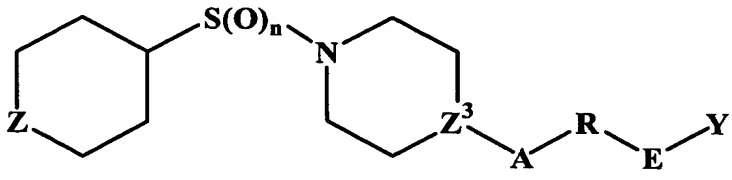
the process comprises contacting a sulfuramine compound with a base to form an anion, and contacting the anion with a carbon dioxide source; and

the carboxylic acid compound corresponds in structure to Formula (87-1):



(87-1); and

the sulfuramine compound corresponds in structure to Formula (87-2):



(87-2); and

each n is independently selected from the group consisting of zero, 1, and 2; and

Z is selected from the group consisting of -O-, -S-, -S(O)-, -$S(O)_2$-, and -$N(R^x)$-; and

Z^3 is selected from the group consisting of nitrogen and carbon bonded to hydrogen; and

R^x is selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, R^a-oxyalkyl, alkylsulfonyl, aminosulfonyl, R^aR^a-aminoalkyl, carbocyclyl, carbocyclylalkyl, carbocyclylsulfonyl, heterocyclyl, heterocyclylalkyl, and heterocyclylsulfonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, amino, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkylthio, alkoxyalkyl, and alkoxyalkoxy, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, and alkyl; and

A is selected from the group consisting of -O-, -S-, -S(O)-, -$S(O)_2$-, -C(O)-, -NR^b-, -CO-$N(R^b)$, -$N(R^b)$-C(O)-, -C(O)-O-, -O-C(O)-, -O-C(O)-O-, -HC=CH-, -C≡C-, -N=N-, -C(S)-$N(R^b)$-, -$N(R^b)$-C(S)-, alkyl, alkoxy, oxyalkyl, alkylthio, thioalkyl, and a bond; and

R is selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxyalkyl, carbocyclyl, heterocyclyl, carbocyclylalkyl, heterocyclylalkyl, carbocyclyloxyalkyl, heterocyclyloxyalkyl, carbocyclylthioalkyl, and heterocyclylthioalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, nitro,

nitroso, hydroxy, oxo, alkyl, alkoxy, alkylthio, alkoxyalkyl, alkoxycarbonylalkyl, C_1-C_2-alkylenedioxy, and alkoxycarbonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

E is selected from the group consisting of -O-, -C(O)-, -C(O)-O-, -O-C(O)-, -N(R^b)-, -C(O)-N(R^b)-, -N(R^b)-C(O)-, -C(O)-N(R^b)-N(R^b)-C(O)-, -N(R^b)-C(O)-N(R^b)-, -S-, -S(O)-, -S$(O)_2$-, -N(R^b)-S$(O)_2$-, -S$(O)_2$-N(R^b)-, -O-S$(O)_2$-, -S$(O)_2$-O-, -C(NH)-, -C(NOH)-, -N(R^b)-C(NH)-, -N(R^b)-C(NOH)-, -C(NH)-N(R^b)-, -C(NOH)-N(R^b)-, alkyl, alkenyl, carbonylalkyl, alkylcarbonyl, and a bond, wherein:

any alkyl or alkenyl portion of a substituent in such group optionally is substituted with one or more independently selected R^c substituents; and

Y is selected from the group consisting of hydrogen, halogen, cyano, alkyl, alkenyl, alkynyl, alkoxyalkyl, alkoxyalkoxyalkyl, alkylthioalkyl, alkylthioalkylthioalkyl, alkylthioalkoxyalkyl, alkoxyalkylthioalkyl, carbocyclyl, carbocyclylalkyl, carbocyclylalkoxyalkyl, heterocyclyl, heterocyclylalkyl, and heterocyclylalkoxyalkyl, wherein:

any member of such group optionally is substituted with one or more independently selected R^d substituents; and

each R^a is independently selected from the group consisting of hydrogen, hydroxy, alkyl, alkenyl, alkynyl, alkoxy, alkoxyalkyl, bisalkoxyalkyl, alkylthioalkyl, alkylthioalkenyl, alkylsulfoxidoalkyl, alkylsulfonyl, alkylsulfonylalkyl, carbocyclyl, carbocyclylalkyl, carbocyclyloxyalkyl, carbocyclylalkoxyalkyl, carbocyclylthioalkyl, carbocyclylthioalkenyl, carbocyclylsulfoxidoalkyl, carbocyclylsulfonyl, carbocyclylsulfonylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclyloxyalkyl, heterocyclylalkoxyalkyl, heterocyclylthioalkyl, heterocyclylsulfoxidoalkyl, heterocyclylsulfonyl, heterocyclylsulfonylalkyl, aminoalkyl, aminosulfonyl, aminoalkylsulfonyl, and alkoxyalkylaminoalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkylcarbonyl, carbocyclyl, and carbocyclylalkyl; and

each R^b is independently selected aryl; and

each R^c is independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, -C(H)(NH), -C(H)(NOH), thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkenyl, alkynyl, alkoxyalkyl, alkylthio, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, and carbocyclylalkyl; and

each R^d is independently selected from the group consisting of halogen, hydroxy, cyano, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkoxyalkyl, -C(O)(R^g), -S-R^e, -S(O)$_2$-R^e, carbocyclyl, alkylcarbocyclyl, carbocyclylalkyl, heterocyclyl, alkylheterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^e is independently selected from the group consisting of hydrogen alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

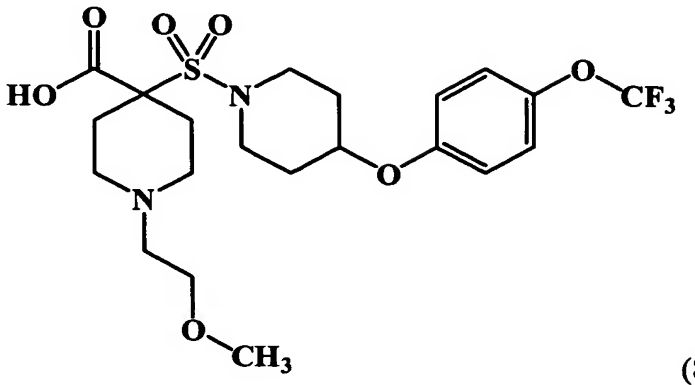
each R^g is independently selected from the group consisting of hydrogen, alkyl, -O-R^h, carbocyclylalkyl, and heterocyclylalkyl; and

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^h is independently selected from the group consisting of hydrogen, alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino.

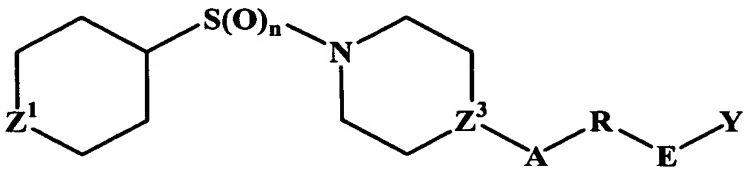
88. A process according to claim 87, wherein the carboxylic acid compound corresponds in structure to Formula (88-1):



(88-1).

89. A compound or a salt thereof, wherein:

the compound corresponds in structure to Formula (89-1):



(89-1) ; and

n is selected from the group consisting of zero, 1, and 2; and

Z^1 is selected from the group consisting of -N(H)-, X^1, and -N(R^{x2})-; and

Z^3 is selected from the group consisting of nitrogen and carbon bonded to hydrogen; and

X^1 is selected from the group consisting of -O-, -S-, -S(O)-, -$S(O)_2$-, and -N(R^{x1})-; and

R^{x1} is a nitrogen-protecting group; and

R^{x2} is alkyl optionally substituted with a substituent selected from the group consisting of R^a-oxy, R^aR^a-amino (wherein each R^a is other than hydrogen), carbocyclyl, and heterocyclyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkoxy, alkylthio, and alkoxyalkoxy, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, and alkyl; and

A is selected from the group consisting of -O-, -S-, -S(O)-, -$S(O)_2$-, -C(O)-, -NR^b-, -CO-$N(R^b)$, -$N(R^b)$-C(O)-, -C(O)-O-, -O-C(O)-, -O-C(O)-O-, -HC=CH-, -C≡C-, -N=N-, -C(S)-$N(R^b)$-, -$N(R^b)$-C(S)-, alkyl, alkoxy, oxyalkyl, alkylthio, thioalkyl, and a bond; and

R is selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxyalkyl, carbocyclyl, heterocyclyl, carbocyclylalkyl, heterocyclylalkyl, carbocyclyloxyalkyl, heterocyclyloxyalkyl, carbocyclylthioalkyl, and heterocyclylthioalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, nitro, nitroso, hydroxy, oxo, alkyl, alkoxy, alkylthio, alkoxyalkyl, alkoxycarbonylalkyl, C_1-C_2-alkylenedioxy, and alkoxycarbonyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

E is selected from the group consisting of -O-, -C(O)-, -C(O)-O-, -O-C(O)-, -$N(R^b)$-, -C(O)-$N(R^b)$-, -$N(R^b)$-C(O)-, -C(O)-$N(R^b)$-$N(R^b)$-C(O)-, -$N(R^b)$-C(O)-$N(R^b)$-, -S-, -S(O)-, -$S(O)_2$-, -$N(R^b)$-$S(O)_2$-, -$S(O)_2$-$N(R^b)$-, -O-$S(O)_2$-, -$S(O)_2$-O-, -C(NH)-, -C(NOH)-, -$N(R^b)$-C(NH)-, -$N(R^b)$-C(NOH)-, -C(NH)-$N(R^b)$-, -C(NOH)-$N(R^b)$-, alkyl, alkenyl, carbonylalkyl, alkylcarbonyl, and a bond, wherein:

any alkyl or alkenyl portion of a substituent in such group optionally is substituted with one or more independently selected R^c substituents; and

Y is selected from the group consisting of hydrogen, halogen, cyano, alkyl, alkenyl, alkynyl, alkoxyalkyl, alkoxyalkoxyalkyl, alkylthioalkyl, alkylthioalkylthioalkyl, alkylthioalkoxyalkyl, alkoxyalkylthioalkyl, carbocyclyl, carbocyclylalkyl, carbocyclylalkoxyalkyl, heterocyclyl, heterocyclylalkyl, and heterocyclylalkoxyalkyl, wherein:

any member of such group optionally is substituted with one or more independently selected R^d substituents; and

each R^a is independently selected from the group consisting of hydrogen, alkyl, alkoxyalkyl, bisalkoxyalkyl, alkylthioalkyl, alkylsulfoxidoalkyl, alkylsulfonyl, alkylsulfonylalkyl, carbocyclyl, carbocyclylalkyl, carbocyclyloxyalkyl, carbocyclylalkoxyalkyl, carbocyclylthioalkyl, carbocyclylsulfoxidoalkyl,

carbocyclylsulfonyl, carbocyclylsulfonylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclyloxyalkyl, heterocyclylalkoxyalkyl, heterocyclylthioalkyl, heterocyclylsulfoxidoalkyl, heterocyclylsulfonyl, and heterocyclylsulfonylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkylcarbonyl, carbocyclyl, and carbocyclylalkyl; and

each R^b is independently selected aryl; and

each R^c is independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, -C(H)(NH), -C(H)(NOH), thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkenyl, alkynyl, alkoxyalkyl, alkylthio, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, and carbocyclylalkyl; and

each R^d is independently selected from the group consisting of halogen, hydroxy, cyano, sulfo, nitro, nitroso, oxo, thioxo, imino, alkyl, alkoxy, alkoxyalkyl, -C(O)(R^g), -S-R^e, -S(O)$_2$-R^e, carbocyclyl, alkylcarbocyclyl, carbocyclylalkyl, heterocyclyl, alkylheterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^e is independently selected from the group consisting of hydrogen alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^g is independently selected from the group consisting of hydrogen, alkyl, -O-R^h, carbocyclylalkyl, and heterocyclylalkyl; and

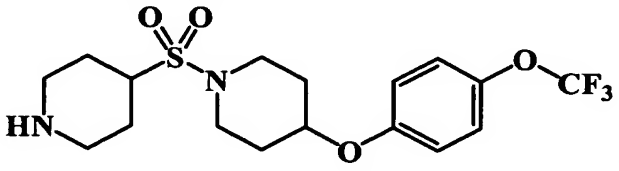
any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino; and

each R^h is independently selected from the group consisting of hydrogen, alkyl, carbocyclyl, carbocyclylalkyl, heterocyclyl, and heterocyclylalkyl, wherein:

any member of such group optionally is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxy, cyano, carboxy, thiol, sulfo, nitro, nitroso, oxo, thioxo, and imino.

90. A compound or salt thereof according to claim 89, wherein Z^1 is -N(H)-.

91. A compound or salt thereof according to claim 90, wherein the compound corresponds in structure to Formula (91-1):



(91-1).

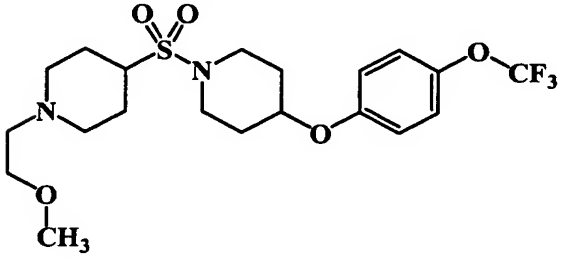
92. A compound or salt thereof according to claim 89, wherein Z^1 is X^1.

93. A compound or salt thereof according to claim 92, wherein:

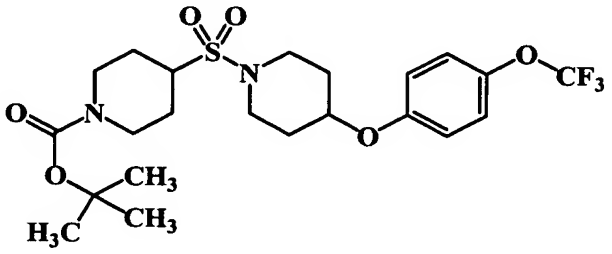
X^1 is -N(R^{x1})-; and

R^{x1} is selected from the group consisting of alkoxyalkyl, alkoxycarbonyl, and arylalkoxycarbonyl.

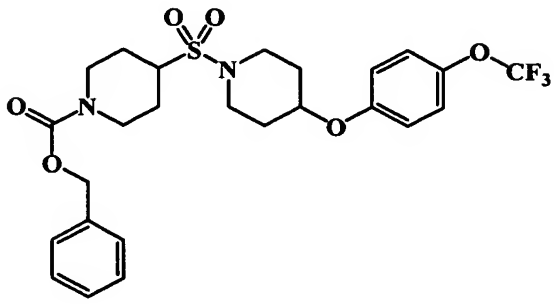
94. A compound or salt thereof according to claim 93, wherein the compound corresponds is selected from the group consisting of:



(94-1),



(94-2), and



(94-3).